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3D WORLD

THE MAGAZINE FOR 3D ARTISTS, IT IS



Starwars

The ultimate guide to Episode III: 3D World
talks exclusively to Industrial Light & Magic

GAME DESIGN

From X-wing to Xbox: animating
LEGO Star Wars: The Videogame



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VFX - SNUBBED AT THE OSCARS?

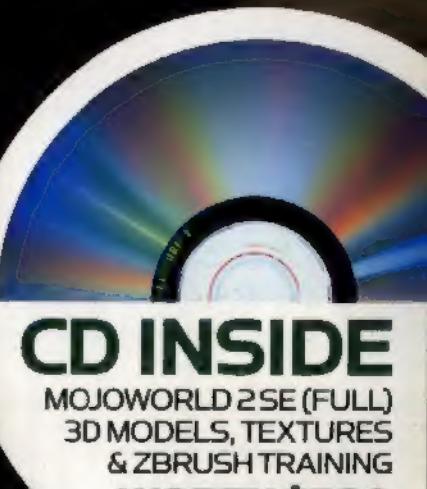
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THIS ISSUE'S WINNER

3D
WORLD

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COVER ARTIST

Industrial Light & Magic

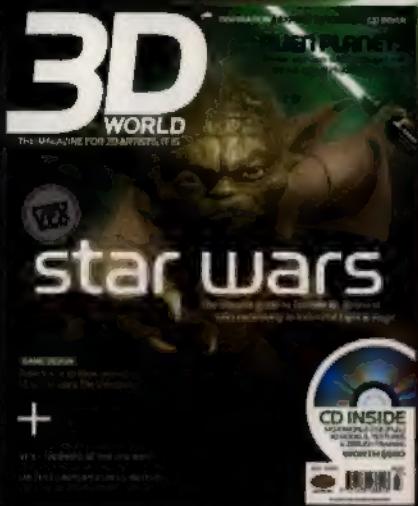
THE ORIGINAL YODA PERFORMANCE came courtesy of a puppet painstakingly sculpted around a cast of the arm of Frank Oz, and turned into latex. Years later, during pre-production on *Star Wars: Episode II*, members of ILM's effects team finally convinced George Lucas that he was a real digital proposition. Then, using a combination of ILM's iSculpt, scanned data from a maquette and Power Animator, Maya and Softimage3D, the all-digital, lightsaber-wielding Jedi Master was born.

Fast-forward to today, and ILM Animation Director Rob Coleman explains Yoda's further evolution. "We can see translucency in his ears," says Coleman. "The surface light is handled with ambient occlusion and depth maps; all that control of illumination has made a dramatic difference. We have breathing, swallowing neck shapes, and his eyes are remarkable. We're thinking about physicality, and about how the way he's feeling affects the way he moves."

Throughout his life, Yoda has been one of the benchmarks of character creation: he first appeared when cinema audiences were witnessing the birthplace of movie animatronics, and his looks have improved with age. Almost 30 years later, as the articulated and soulful fully CG Yoda kicks ass at the multiplex for a final time, we pay tribute to his Excellency in our *Star Wars* feature on page 30, and ask the burning question: a cooler alien ever will there be?

(w) www.ilm.com





star wars

050 *Revenge of the Sith* sees ILM's VFX wizards bid farewell to *Star Wars* in spectacular style

Alien planets

050 Be your very own George Lucas: follow this starter tutorial for the full copy of *Mojoworld* on the CD to create new science-fiction landscapes.

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064 Far more than a tie-in, *LEGO Star Wars* is a hotly anticipated game in its own right. We visit Giant Interactive Entertainment to uncover the building blocks of its 3D work

All about the eyes

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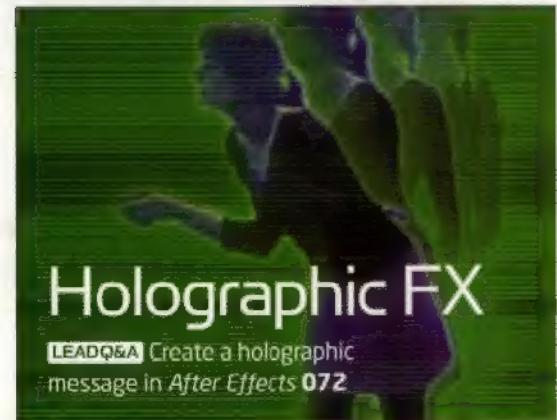
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3D WORLD advisory board

3D World is brought to you with the help and advice of leading 3D industry figures

SHELLEY PAGE

 Shelley Page started her career in feature animation as Backgrounds Supervisor on Disney's *Who Framed Roger Rabbit?* She was one of the first artists hired to form DreamWorks Animation in 1995. She is now DreamWorks' European Representative resourcing new talent for the studio.
www.dreamworks.com

JORDI BARES

 Jordi Bares worked for eight years in the games and film industries in his native Spain before moving to London in 2000, where he has also freelanced at Jim Henson's Creature Shop and Passion Pictures. The winner of many awards, he was nominated for an Emmy for his work on the BBC documentary *Pyramid*.
www.themill.com

ANDREW DAFFY

 Andrew Daffy has worked in the CGI industry for ten years on projects that have accumulated over 30 awards. He was recently named one of Alias's *Mayo Masters* for 2004. His new company, The House of Curves, will act as both a studio and a training school.
www.thehouseofcurves.com

ALEX MORRIS

 Director, Hayes Davidson
Alex Morris qualified as an architect in 1990 and joined architectural visualisation agency Hayes Davidson in 1996, having completed over 40 buildings across a number of sectors. He is responsible for many of HD's landmark images, including the UK's Millennium Dome, and the Tate Modern art gallery.
www.hayesdavidson.com

JOLYON WEBB

 Principal Artist, Codemasters Software Company
Jolyon Webb moved into developing game art after years as a freelance illustrator. He works at leading videogame studio Codemasters as Principal Artist in the Central Technology Group; the company's internal research and development team.
www.codemasters.co.uk

AARDMAN ANIMATIONS

 Scott Pleydell-Pearce, Bobby Proctor and Stefan Marjoram Respectively CGI Animation Head of Department, CGI Lighting/Technical Head of Department and a Creative Director for the commercials department. Scott, Bobby and Stefan have over 20 years' combined experience at Aardman, working on a range of award-winning ads, idents and short films.
www.aardman.com

Editor's perspective



Are 3D artists cool? Or, to put it another way, is 3D a lifestyle choice that many people in the outside world would want to make? The question was forced into my mind this month with the launch of a new range of products targeted at "animators, modelers and computer artists focused on fun". Or, as the company's slogan would have it: 'creative clothing for creative people'.

Created by the same company as the Digital-Tutors training DVDs, visitors to the Your Next Tee website, www.yournexttee.com, are treated to a range of perky, sub-catalogue models (so many styling products, so little time...) dressed in T-shirts with 3D-related slogans ranging from 'FK it' and 'Tondle My Dongle' to the truly mind popping 'Mocap Fo Shizzol'.

The initial reactions of the CG community might best be summed up as 'guilty recognition'. "I wouldn't say that they're nerdy - or, in fact, they're so über-nerdy, no-one would think that they're nerdy," ran one fairly typical forum posting. Or, to put it another way: "So lame, they're great".

So there you have it. The masons have special handshakes to identify themselves to one another; 3D artists have T-shirts with slogans they have to explain to outsiders in the pub.

But what does that outside world really think of us? We may get to preserve our strange haircuts, work unsociable hours, and generally defer the whole tedious business of becoming a proper adult for a few more years, but it's hard to see a career in CG having quite the same kudos as, say, being in a band. (At least, not unless The Libertines' idea of a good night at work secretly turns out to be sitting in a darkened room waiting for a render to finish.) The punters may look at the end results and marvel, but then, most of them still think that the computer does all the work. All in all, Your Next Tee probably sums up the public's opinion of 3D artists pretty accurately: caught midway between geek and chic.

So can CGI ever become the new rock and roll? And does it really matter? Answers to the usual address, please, marking your emails 'Suck on These NURBS'.

But now, another musical connection. This month, Owen Bailey, the hidden driving force behind *3D World*, and the writer of most of its best jokes (many of them sadly destined for the cutting room floor at the behest of a nervous editor) is leaving the magazine. Owen goes off to become Deputy Editor on our sister title, *Guitarist*, in order to explain the hidden mysteries of frets and amps, and to make Slash, Satriani and Santana seem relevant to the modern generation. And that, surely, is a market more in need of good sloganeering skills than 3D will ever be. Although 'swap your renders for Fenders' does have a certain ring to it...

JIM THACKER Editor
jim.thacker@futurenet.co.uk

LETTER OF THE MONTH

After reading Colin Kai Heaps' Letter of the Month in issue 63, I wanted to add a few points. Firstly, Colin didn't mention www.shiowproject.com, the collaborative CG team he has been part of for the last year. The saucy lad is now in a position to speak boldly, but our team knew him back when he was in the same position as Chris and many other 3D wannabes – new, and sometimes frustrated due to lack of ability. [Colin wrote to us in response to Chris Leighton's letter in issue 60, complaining how hard it was to get started in 3D – Ed.]

In Colin's case, he has long since got over any such frustrations and today, he's one of our main team members. Not only have his modelling skills improved vastly, but he is also now our resident MotionBuilder guru! So what helped him go from newbie to guru in such a short space of time? As he says, work and practice are essential, but what about the team he had encouraging him to keep at it?

I think that some people trying to break into 3D become discouraged because they basically end up doing all that work and practice alone. If, like Colin, they were to seek out and join a collaborative team, it could be so much better for them. Just as being in a band gives you the opportunity to get together, jam

with your friends and maybe have a pint or two, a collab team is more fun because you're not all alone.

For example, shiowproject has a forum where we post our work in progress and get steady feedback from team-mates. We regularly discuss team issues online in real time, and

have even made friends through the project. If we feel frustrated, we have the others spurring us on. I'm pretty sure none of us would be as far along as we are without the benefits of this way of working. To take the band analogy a step further, if Mick Jagger had only practised singing alone at home, where would the Stones be today?

**softdistortion | Team Leader,
shiowproject**



● A rendered still produced by shiowproject, an online 3D collaboration team

MAC ADDICTION

> In response to your article on whether there is a future for 3D on the Mac, having used Macs to do 3D for the past seven years, things certainly look fine to me.

Our company is entirely Mac-based, except for one shuttle PC that we bought as an experiment, looking to develop a cheap render farm for Cinema 4D NET. Although the PC is a very fast renderer (its single Athlon 2.8GHz processor almost keeping up with a dual 1.42GHz G4), we found that its 1GB of RAM would return 'out of memory' errors on projects that our older Macs would chug through with only 512MB. This problem may have been overcome with Windows XP, but once bitten...

Buying PCs in bits and putting them together may look like a cheap option. But as these

parts no longer come bundled with Windows, by the time you add all of the costs up, there's virtually no difference to buying an equivalent Mac. So we've ended up opting for expensive G5 servers which chew through anything we throw at them, with characteristic Mac reliability.

And, at the end of the day, it's better than the devil you know. When I first started using Macs, it infuriated me that there was no equivalent of DOS to sort things out. Now that I can handle a Mac, I don't have a clue what to do when PCs go wrong. Having the option of software like Softimage|XSI would be nice – but then again, the difference between



● Fast and reliable, or expensive and over-specialised? The jury is clearly still out over the use of Macs in the 3D industry

top-end apps is similar to the difference between the machines themselves: a matter of personal preference.

Will Adams | Once Were Farmers

Reliability is certainly an important issue when choosing a hardware platform, particularly for a small company. But as some of the other feedback we received this month indicates, not everyone agrees about the benefits of Macs – or of the importance of having access to software like XSI.

MAC DERISION

> There were two articles in issue 63 that I would like to comment on. The first article is the one about the future of 3D on the Mac; the other is Craig Zerouni's opinion column, 'Shake, rattle and roll'. In my opinion, the first article contains a major omission – a point of view that the second partly supports.

Apple has not achieved the dominance in the 3D market that it has in 2D design, and probably never will. The Mac has always been the best personal computer available, but the

cause of its strength has also been a limitation. The rigid controls the company enforced over its hardware backfired because inferior [Windows boxes] offered something that Apple didn't – choice. In particular, the wide range of compatible hardware had a greater appeal to hobbyists than the quality of the Mac.

These hobbyists that chose the PC then went on to have a profound influence on one of 3D's biggest market sectors: videogames. This is a huge industry in which Mac has very little influence. To this day, two of the major software packages used in game development, 3ds max and Softimage|XSI, only run on PCs.

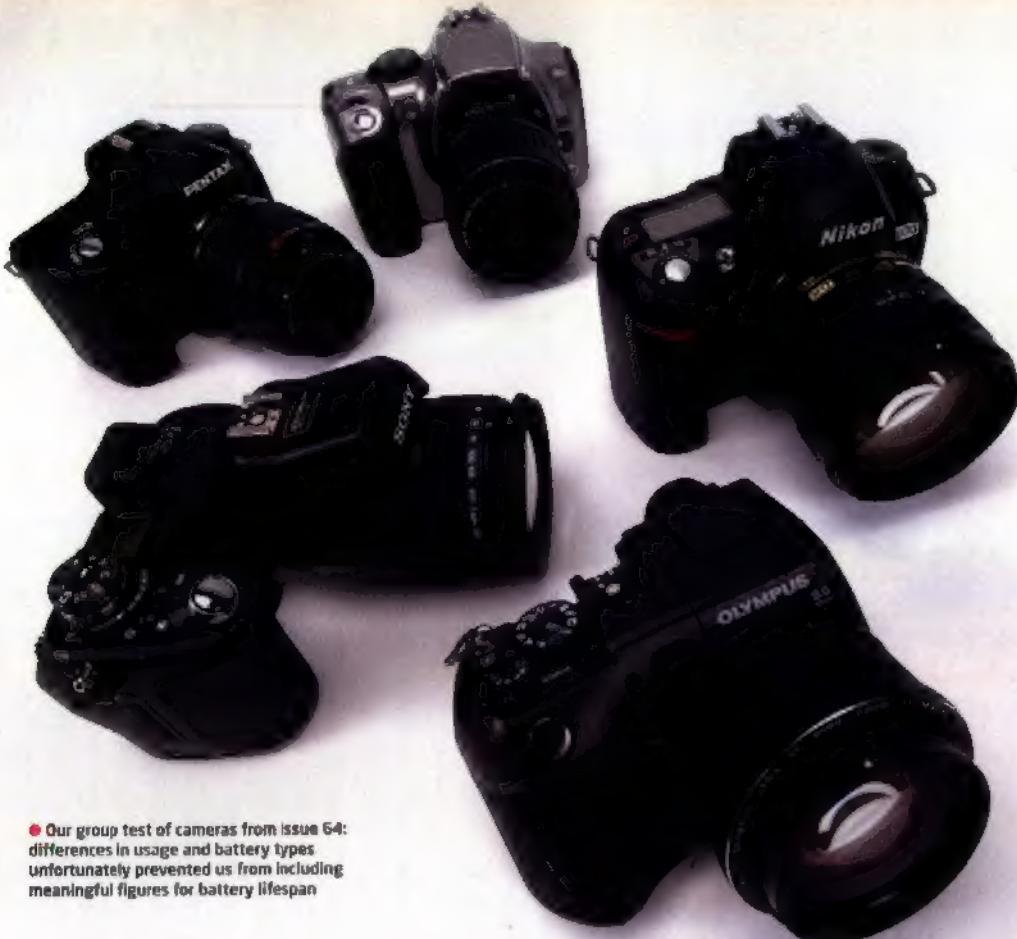
And when Apple did acquire a 3D-related package, it was Shake. This seems a further part of the company's policy of focusing on high-end, flashy industries like film. Shake may be the best desktop compositor around – but then, this isn't the first issue in which Craig Zerouni has called for open-source compositing software.

Your article focused primarily on the film industry. But the PC doesn't cater to specific industries, and that's why it has

LETTER OF THE MONTH

Congratulations to softdistortion, who wins a copy of *Machinelash*, published by Ballistic Publishing. The first book in the CG Challenge series, it features the images and techniques of artists participating in the online contests organised by CGNetworks.com and CGTalk.com. The book has tutorials and artwork from the contestants of the Machinelash Challenge. www.ballisticpublishing.com, www.cgnetworks.com





Our group test of cameras from issue 64: differences in usage and battery types unfortunately prevented us from including meaningful figures for battery lifespan

a broader appeal than the Mac. XSI offers its users built-in compositing, while combustion offers excellent 3ds max integration.

Using my Intel machine, I can make mods for Half-Life and do compositing work – and all without having to switch software package.

Simon Hayes | Via email

The mass appeal of PCs has certainly been an incentive to develop for Windows. But surely game development is no less a high-end field than the industries in which Macs have traditionally been dominant? Thanks for all your feedback on the relative merits of Macs and PCs. While this subject is now closed for correspondence, you can by all means post further comments on our forum.

BATTERIES NOT INCLUDED

I really enjoyed your review of the five digital cameras in issue 64. But nowhere in the reviews of any of the cameras did you mention what kind of batteries they used, and how long those batteries lasted. Was this information taken down? If so, I would love to know the results, as I'm thinking of upgrading my camera and would consider it to be

important information. It's most annoying to get halfway through a shoot and have the batteries run out.

Jutta Stüller | Via email

We forwarded Jutta's email to Mat Broomfield, our reviewer, who replied: "I didn't include battery lifespan in the reviews since there are so many factors that affect the overall figure. By far the most important of these is the frequency with which you use the flash, and the amount of power it draws. The other major problem in arriving at a definitive figure is the fact that some of the cameras include rechargeable Lithium-Ion batteries, while others use off-the-shelf AAA cells. The rechargeable ones tend to last longer, but cost much more to buy. Thus, it's unlikely that you would take three or four spare sets on a shoot. Furthermore, if they run out, you can't just pop to a local chemist for refills. For preference, I would never buy a camera that uses proprietary rechargeables."

IT'S ALL A BLUR

I have noticed that the line between different software

packages – in my case, mainly Photoshop and 3ds max – is becoming a bit of a blur. Does anyone else find themselves trying to rotate a photo using the 3D controls? I do.

And then there is 'vertex eye'. This happens when you are modelling in vertex mode only to find that your face is nearly pressed against the monitor, as if being drawn in by the vertex. After several hours of this, you develop a strange eye twitch. Is this normal?

DangerHouse | Via the forum

Probably not, but then, isn't it high time 3D had its own 'status ailment'? At the minute, the best we can claim is Repetitive Strain Injury, which any office worker can manage in a matter of months. If you've managed to contract Inflamed NURBS or Render Wrangler's Lung over the course of your career, our inbox is standing by...



Vertex Eye – could this be a candidate for the 3D users' very own, brand-new status ailment?

CONTACT 3D WORLD

3D World Magazine, Future Publishing
30 Monmouth Street, Bath, BA1 2BW
(T) +44 (0)1225 442244
(E) 3dworld@futurenet.co.uk
(W) www.3dworldmag.com
(forum) <http://forum.3dworldmag.com>

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3dworld@subscription.co.uk or call +44 (0) 1858 438 794

EDITORIAL

EDITOR Jim Thacker jim.thacker@futurenet.co.uk
ART EDITOR Kai Wood kai.wood@futurenet.co.uk
DEPUTY EDITOR Owen Bailey owen.bailey@futurenet.co.uk
PRODUCTION ASSISTANT Sarah Rosenberg sarah.rosenberg@futurenet.co.uk
SENIOR NEW MEDIA EDITOR Matt Gallimore matt.gallimore@futurenet.co.uk
ONLINE EDITOR Jim McCauley jim.mccauley@futurenet.co.uk

WORD CONTRIBUTORS

Het Innenfeld, Leigh van der Byl, Rob Cazier, Simon Cornish, Elvin Dilmur, Peter Draper, Sean Freeth, Ruth Fry, Lee Sage, Jon Jordan, Ollie Mathews, Mike McNulty, Gary Noden, Nicholas Oxley, Chris Ollis, Mark Bamshaw, Ed Roberts, Barbara Robertson, Mental Ray, Ben Schipper, Sandeep Sharma, Ben Smith, Josh Staub, Martin Southwood, Adam Swanson, Mark Whittaker, Craig Zerbeau

ART CONTRIBUTORS

Tim Bird, Simon Cornish, LM, Jeremy Parker, Glaston Interactive Entertainment, Colin Hignett, Sel Animation

PRINTING

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ADVERTISING

ADVERTISING MANAGER Rosa Smith rosa.smith@futurenet.co.uk
KEY ACCOUNT MANAGER Lee Haines lee.haines@futurenet.co.uk
SENIOR SALES EXECUTIVE George Lucas george.lucas@futurenet.co.uk
CLASSIFIEDS **Rebecca Bell-Robinson** rebecca.bell-robinson@futurenet.co.uk

PRODUCTION

PRODUCTION MANAGER Clare Tilney clare.tilney@futurenet.co.uk
SENIOR PRODUCTION CO-ORDINATOR Diana Ross diana.ross@futurenet.co.uk
PRODUCTION CO-ORDINATOR MARK ARNON mark.arnon@futurenet.co.uk
OPERATIONAL PURCHASING MANAGER Michelle Rodgers michelle.rodgers@futurenet.co.uk
ACQUISITIONS PRODUCT MANAGER Julie Sewell julie.sewell@futurenet.co.uk
AD PRODUCTION MANAGER Nola Palmer nola.palmer@futurenet.co.uk
CLIENT SERVICES EXECUTIVE Emily Hunter emily.hunter@futurenet.co.uk
COPYRIGHT CO-ORDINATOR Sarah Williams sarah.williams@futurenet.co.uk
CD ROM PROJECT MANAGER Robert Fuerstman robert.fuerstman@futurenet.co.uk

MANAGEMENT

PUBLISHING DIRECTOR Kelley Carter kelly.carter@futurenet.co.uk
PUBLISHING DIRECTOR Dom Beaven dom.beaven@futurenet.co.uk
MARKETING MANAGER Fiona Tully fiona.tully@futurenet.co.uk
MARKETING AND ART EDITOR Paul McIntyre paul.mcintyre@futurenet.co.uk
GROUP SENIOR EDITOR Nick Merritt nick.merritt@futurenet.co.uk
EDITORIAL DIRECTOR Jim Douglas jim.douglas@futurenet.co.uk
MANAGING DIRECTOR Robert Price

NON-EXECUTIVE CHAIRMAN Roger Parry

CHIEF EXECUTIVE Greg Ingham

GROUP FINANCE DIRECTOR John Bowman

INTERNATIONAL LICENSING

INT'L MARKETING LICENSING DIRECTOR Simon Lear simon.lear@futurenet.co.uk
(T) +44 (0)1225 622799

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Marketforce (UK) Ltd, 5th Floor, Lawline Building, Kings Reach Tower, Stamford Street, London, SE1 9LS

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EXHIBITION

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IMAGE OF THE MONTH



Congratulations this month to Fred Bastide, who wins a copy of the ART VPS HDRI CD Library, worth \$130. This prize is supplied by ART VPS, creators of the powerful PURE hardware 3D rendering cards. www.artvps.com



STEVE CARREY 3ds max

www.stevecarry.com

"I'm a 3D artist and I work in the defence sector in Bristol, UK. I've been working in 3D for about four years now. I'm currently working on a simple set of Tudor-style buildings. The lighting position is the same as the standard one in Max. I'm not a mentor.

[e] esceice@ao.com

[w] www.portfolios.com/esceice

JUSTIN DOWLING Sun In An Empty Room

3ds max 5.1, Brazil 1.0, Photoshop

"I'm an advanced media developer working in the defence sector in Bristol, UK. This image was a simple exercise in the use of different lighting styles (it has one skylight, one area shadow spot and one raytrace shadow spot). I think its effectiveness comes from its simplicity and, of course, Edward Hopper's excellent composition."

[e] jedward.dowling@hotmail.com

HELIUS RUGENS 3ds max

3ds max, V-Ray, Photoshop

"I'm 34 years old and I live and work in the French part of Switzerland (Luzern). I work in aerospace and have been using 3ds max since version 3.0. I'm a beginner in 3D and I'm learning every day. I'm interested in architectural visualization and I'm currently working on a project of a residential building. I'm also interested in game engines. I'm not a mentor.

[e] heilius@bluewin.ch

[w] www.knowlexwelt.net



EXHIBITION

Send us your exhibition images | For address, see page 9



Mystical Morning, Evening: The City Gate
3ds max, Photoshop

'I started my career as an interior decorator and designer nine years ago, and then moved into 3D modeling. I'm not formally trained, and I learnt a lot by creating images with passion. I had a degree in Chinese literature, and many skills in writing apply to image designing too. My aim was to create these images with typical Chinese characteristics. I enjoy visiting old villages and towns, collecting material for my work.'

[e] exquisitus@263.com
[w] www.exquisitus3d.com





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3D ARTISTS Genesis, In Laurin's View Cinema 4D

"After working for several years as a scanner operator in three different companies, I myself founded our own UK company. My first contact with 3D was in 1998. I'm now working on a Mac using Cinema 4D. My latest addition is ZBrush."

www.genesis3d.com

3D ARTISTS You'll Always Have In My Mind Cinema 4D, Vue

"I started using Cinema 4D 6 in 2003 as a tool for populating landscapes generated in Vue 4. I switched to Cinema 8.5 in 2004 and am now using version 9.1. I'm trying to master C4D as this would enable me to animate my worlds."

clerique.barreto@outlook.com

www.vision3d.com

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(The deadline for submissions has now been extended to 31 August 2005)

3D ARTISTS idutsu

Shade

"I've been creating computer graphics for four years and I'm learning 3D CG by myself. My main tool of the moment is Shade. I like modelling humans and rendering a fantasy."

idutsu@jpn.ne.jp

www.renderosity.com/homepage.cgi?username=idutsu



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Is mobile 3D finally on the move?

MOBILE GAMING Two years ago, experts predicted that by 2005, 3D games on mobile devices would be everywhere. They were premature – yet recent stirrings suggest the sleeping giant is finally waking...

When we compiled our mobile gaming feature in 2003 [The Shrinking Game, issue 43], the world of gaming seemed to be ready to quite literally nestle in the palm of future gamers' hands. While some of the predictions that were made back then haven't transpired, recent events – such as the buzz at the Game Developer Conference 2005 on the subject, Electronic Arts entering the market with 3D titles, and 3D Pool (published by i-play and developed by Distinctive Developments) becoming the first 3D game in the top ten UK games downloads – once again prompt the question: "Is now the time for 3D artists to get excited about mobile gaming?"

The numbers indicate that, on a global scale, mobile gaming is "skyrocketing" – analyst Screen Digest estimates a global market worth over \$1 billion in 2004, and set to rise considerably over the coming years. "Our 2005 estimate of \$1.7 billion is well accepted by the industry," said Ben Keen, Chief Analyst at the company. "Network operators are becoming very interested in having more 3D games available for download, so many more will certainly follow."

But which device will they be on? Keen notes that while Symbian-based devices such as N-Gage have better 3D performance, the majority of these are still aimed at business users. "The N-Gage has had 3D titles since launch," he added. "However, these have not been runaway commercial success as the mobile phone games market is dominated by Java devices." New players on the mobile device scene (the games-specific mini consoles PSP, Nintendo DS and the

Gizmondo) offer advanced graphical power and obviate the nagging control issues that dog 3D gaming on traditional phone devices. Yet it's still hard to imagine anyone but Nathan Barley whipping out their portable gaming unit to wish their gran a happy birthday. So why are we still waiting for 3D to take off on phones?

In our original article, Discreet's Keith Russell (now at videogame service provider Babel Media) predicted an upsurge in growth, but admits that this has been slower to materialise than he anticipated. "The business models have not developed as fast as we thought, so developers are still very cautious of increasing development costs," he said. "The challenges of navigating in a 3D environment on a basic handset are still to be fully conquered, but probably the biggest hindrance have been the slow adoption of JSR 184 as a standard,

and the solving of the engine on the handset versus the engine as part of the download."

Like many in the industry, Russell sees marketing as a stirring point for adoption. "The buying demographic is still too console-like in mobile; it's the number of downloaders that really, really

matter" David MacQueen, Mobile Games Analyst at Screen Digest points out that network operators don't want to promote individual games; they don't want to 'pollute' their brand with another, so ads for games services have been non-existent or extremely generic. The profile of the mobile games industry is much lower than it should be."

However, some developers are convinced that they're already part of the Gold Rush. "2005 is the year that 3D mobile gaming will take off, we've seen a tremendous surge in interest and development plans from the major mobile publishers, targeting 3D game development," says Thor Gunnarsson of ideaworksRD, the developer

PLUGGED IN

CLAMORATION
Our story in issue 64 about the release of 3ds max 7.5 used a pic from Blur Studio's Gopher Broke short film, next to the caption "Hair of the Gopher". 3ds max was used in the production of Blur Studio's excellent Oscar-nominated short film, Gopher Broke". So there can be no possible confusion over which product was used in the short, distributor Turbo Squid has requested we clarify the following point: hairfx from Dimension dESIGN Animation Group was the product used to create the Gopher's fur www.blur.com



"3D MOBILE GAMING WILL TAKE OFF IN 2005... THERE'S A TREMENDOUS SURGE OF INTEREST"

THOR GUNNARSSON, IDEAWORKS RD



TALKING POINT | 3D mobile gaming



If you look at the GDC sessions, you probably note that most of the technology (RenderWare and X-Forge) are being demonstrated on PDAs. The gulf between typical mobile phone capabilities and those of a PDA is massive, and it will be some time before these technologies find a mass market phone."

David MacQueen
Mobile Games Analyst, Screen Digest



"Now is the time for 3D artists to look at which part of the industry they'd like to be working in five years down the road and make the transition now. 3D technology and art must be adapted to the uniqueness of the mobile environment. Those artists that enter the mobile arena have a real opportunity to shape the future of mobile entertainment."

Kurt Uhlir
Chairperson, IGDA Mobile-SIG



"3D artists that have good experience with low-polygon environments and a talent for wringing high visual quality from pre-built texture maps should do extremely well in this market for the coming future. If you spent any time in the '90s working in software-rendered environments such as PC gaming, your skillsets are all highly relevant today."

Thor Gunnarsson
Executive Director, Ideaworks3D

of BRFW title *Tony Hawk's Pro Skater: 3D Mobile Edition*. The company is showcasing a number of projects at LA3D, including its first major original title, *System Crash*, on N-Gage, and a couple of high-profile projects with EA Mobile. He believes EA entering the market with the stated strategy of driving the transition from 2D to 3D mobile gaming will open the floodgates for 3D games developers to switch to mobile phones. "My feeling is that there's actually more demand for 3D development than supply."

That talent, according to Gunnarsson, partly consists of "being able to bridge art creation for dual software and hardware rendered worlds. [this] will be priceless for development studios over the next few years in the mobile domain." And for будущие 3D artists, he has this advice: "Perfect the lost art of extremely low-poly modeling, or become a master of pre-t texture mapping. Before we have wide

deployment of hardware accelerated mobile phones, these skillsets will be critical to any 3D mobile development project."

As Chairperson of the IGDA's Mobile Game Development Special Interest Group, Kurt JH is ideally placed to assess the industry. He sees it as a growing market but says that as the mobile industry matures, the differences in development needs of 3D artists are likely to segment. Mobile console teams will always be bigger but not necessarily better. 3D development for the home-console, mobile and phone market offers more opportunity for individuals with their choice of projects given the responsibilities they have in these teams," he says. "The next step for me will be when I mention that there are already millions of 3D-capable mobile devices on the market, and the developers are not surprised by the statement."

www.mobile3dworld.com; www.igda.org/mobile

PRE-VIZ
Mobile 3D

FEED & BACK

We want to hear from you on the issues affecting 3D artists, so turn now on, once you've read our main news story on the facing page, why not visit our forum and post your reaction to it online?

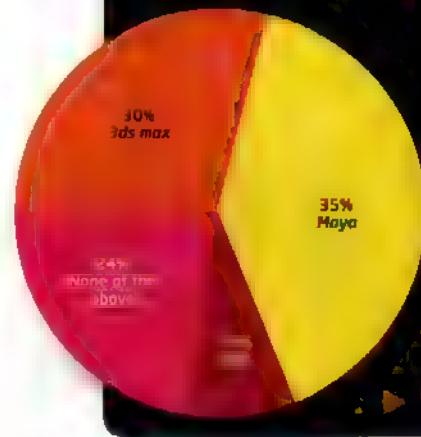
This issue's question concerns the mobile gaming revolution. Despite initial predictions that we would see an explosion in 3D titles by the start of this year, this has so far failed to materialise. So where does this leave an artist hoping to move into the industry? Are 3D games on mobile devices really technologically ready to be considered as a realistic career choice? This month, the question we would like you to answer is:

"Is now the time for 3D artists to get excited about, and start preparing to work in, 3D mobile gaming?"

- Now is the time - The floodgates are about to open
- Not quite yet - Limitations like basic phone formats, downloads and marketing spoils are still unresolved
- Not for ages - Until more 3D games titles will remain excruciatingly slow
- Never - 3D gaming is too visual, it's best left to PCs and consoles, not phones and tiny handheld screens

LAST ISSUE: THE VERDICT

"Which of the big three 3D-applications is likely to dominate next-generation development?"



Animated Encounters 2005

SHOW REPORT A galaxy of 3D stars, from studio heads like Jeffrey Katzenberg to students and indie filmmakers, made their way to Bristol, home of Aardman, for this year's Animated Encounters festival

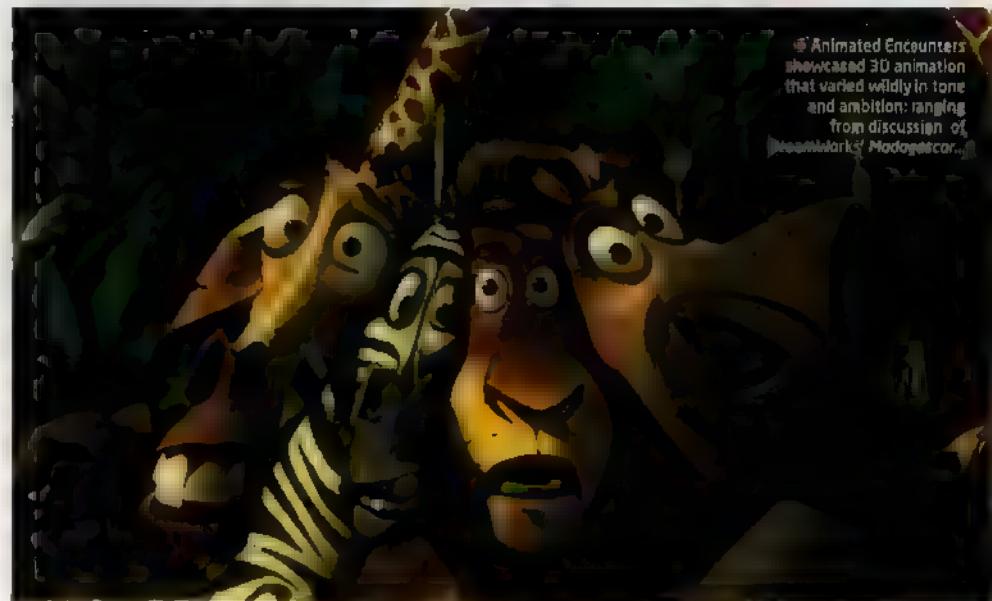
Animated Encounters International Animation Festival, which took place at Bristol's Watershed cinema and @Bristol's IMAX theatre between 21 and 24 April, is a low-key annual affair with something for people from all echelons of the 3D Industry. Because of this, it's able to offer a level playing field in which student hopefuls can rub shoulders with 3D producers, animators, directors and even heads of studios. Featuring awards, conference sessions and special events like a sneak preview of the new Aardman/DreamWorks production, *Wallace & Gromit: The Curse of the Were-Rabbit*, the festival successfully covers many diverse areas of animation.

Sessions-wise this year's Animated Encounters put together a varied programme, with panel discussions designed for high-flying programme funders all the way down to the job-seeking student. At the lower end of the scale Showreef Surgery brought together a gathering place from across the 3D industry (from DreamWorks' Shelley Fuge to Studio Aka's Marc Castle among many others) to offer tips on creating a reel, insight into the process of candidate selection, and to show excerpts from reels that exhibited the 'wow' factor necessary to thaw the all-but-frozen heart of the CG industry recruiter.

The main conclusions to be drawn from the discussions were that the 3D industry's small size means that having a job already is the best way to get a job, that a good reel will likely be passed around many companies, that being honest about your competence, being polite and having humility is a necessity and that overridingly important rule—that "persistence" should never tip over into "stalking".

Over in the show's Business of Animation session panelists identified the increasing importance of overseas funding when launching major UK based productions, and the attendant implications for directors and series creators.

"The days of a colloquial British show being accepted into an international market are largely over," commented Cosgrove Hall's A. Read—a phenomenon jokingly dubbed "the international biscuit crisis" in response to the headline "Postman Pat eats cookies" which appeared in the trade



Animated Encounters showcased 3D animation that varied wildly in tone and ambition: ranging from discussion of *DreamWorks' Madagascar*...

press, when the popular, distinctly UK centric kids' TV show was picked up for American distribution.

This trend is amplified by the increasing influence of anime on the UK animation industry. "There's already a cultural stream that flows downhill from the US [to the UK]," commented HIT Entertainment's Chris Skala. "You'll soon see a commensurate stream that flows downhill from Japan."

point of the session. Above all, Katzenberg's answers offered insight into the running of his multi-billion dollar company, somehow remaining down-to-earth and enthusiastic.

You'd be forgiven for thinking that someone in his position would long ago have viewed animated films only in terms of financial success, yet Katzenberg's love of the medium is genuine, whether reading *Shrek* as "the movie we

"DREAMWORKS MAKES MOVIES FOR ADULTS, AND THE ADULT THAT EXISTS IN EVERY CHILD"

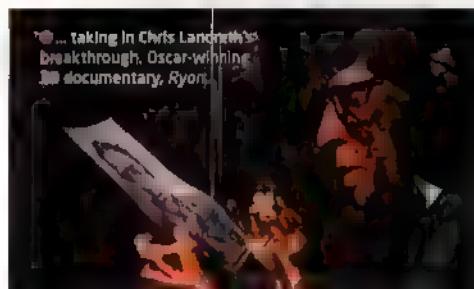
JEFFREY KATZENBERG, CO-FOUNDER, DREAMWORKS SKG

Jeffrey Katzenberg—DreamWorks supremo and the R-SKG (the Spielberg, Katzenberg, Geffen triumvirate behind the company) was the festival's keynote interviewee. Sitting in Bristol's lush IMAX 3D theatre he was quizzed by Aardman Animations Co-Founder David Sproxton. Perhaps a less partisan questioner would have given him a rougher workout on some of the issues raised, but this wasn't the

atmosphere in which we finally found the Holy Grail of what made a DreamWorks animated "movie" or neatly pinning down the Dreamworks formula as making "movies for adults, and the adult that exists in every child," or even offering advice for new CG start-up studios. "Have a great story – if you have a great story everything else will come together."

His most animated moments came during discussion of whether the CG movie market is reaching saturation point. "Not even close, and not coming for years," was his tactful prediction. The session closed with an extensive audience Q&A covering issues such as how the role of voice actors in animated movies differs in comparison to live-action work, Katzenberg's own day-to-day role at Dreamworks, and how the company survived the lean times.

Later that evening, Katzenberg discussed his ten favourite toons to take to a desert island in an onstage interview with journalist and film critic Mark Kermode. www.animated-encounters.org.uk



... taking in Chris Langford's breakthrough Oscar-winning documentary, *Rynda*.



... and handling a UK festival debut to Owen Wilson's kids' short *Mischiefous Mirrors*.

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WEBSITE OF THE MONTH
www.heavy.com

ENJOY THE CHILDISH DELIGHTS of *Pimp My Weapon*, a new Machinima Stories created by the Heavy.com broadband network and Sony to advertise upcoming PlayStation title *God of War*. In *Pimp My Weapon*, a muscular warrior character from the game called Kratos has, by way of an excellent voice-over, webisodes, hosted by Ron Johnson, the party and enthusiastic host of a 'How To' series, who explains different ways we can Get to Know the Chain General with the help of long-suffering colleague Stan Grossman, whose complaints of a bruised coccyx and unpleasant burning sensations fall on deaf ears as Ron demonstrates how to master the art of Proper Leaping About, and takes us through the 'math' behind

Further sites...

<http://ax.cgchannel.com>
CG Channel Exchange is an online resource from the makers of CG Channel, aimed at helping 3D artists to market their 3D meshes, models, shaders, scripts, textures and more.

<http://www.apple.com/trailers/universal/serenity>
Joss Whedon's SF series *Firefly* will return to *Serenity*. Zack and J (Rhythm and Hues) provide the

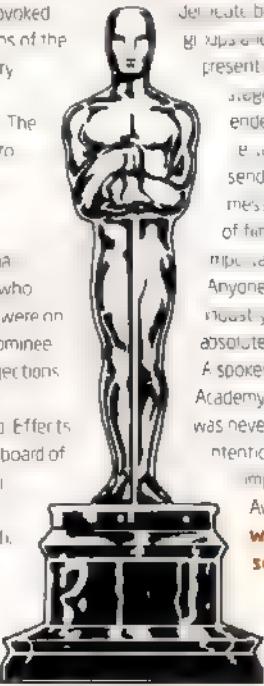
3D OSCAR 'SNUB'?

TOYS, PRAM Oscars telecast branded 'demeaning' by 3D body

MEASURES TO speed up the Oscars ceremony provoked anger among sections of the VFX effects industry according to the *Hollywood Reporter*. The Academy's decision to award statuettes in some categories

including the Achievement in Visual Effects to winners who remained seated or were on stage as part of a nominee line-up, met with objections from the Executive Director of the Visual Effects Society and the board of directors of American Cinema Editors.

An irate Eric Roth, VFX Executive Director contacted the Academy Awards Producer G. Cates to



complain. "The decision to demote between certain VFX categories by presenting awards either stage or in the audience ended up demeaning the entire category by sending the not so subtle message that some areas of filmmaking are more important than others."

Anyone who works in our industry knows that this is absolutely untrue." A spokesperson for the Academy explained that it was never the organization's intention to diminish the importance of any of the Award categories.

www.visualeffectsociety.com

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ONEDOTZERO9
27 MAY-5 JUNE, LONDON
onedotzero's annual moving image festival gets underway at London's CA, showcasing all that's fresh and exciting in the world of digital film, animation, game graphics and pop promos. Visit the site for the fest's line-up: www.onedotzero.com

VISIONFEST
2-5 JUNE, INDIANAPOLIS, USA
Students can meet industry pros, discuss work, exchange ideas, set friends and party at this North American festival, which aims to foster and support the development of animation, new media and interactivity. www.visionfest.org

RUSHES SOHO SHORTS FESTIVAL 2005
30 JULY-5 AUG, LONDON, UK
If you're in Soho in August, you'll be able to see the best entrants to the seventh Rushes Soho Shorts Festival as they're played in the area's bars and cafes. The celebration of short films culminates in an awards show. www.sohoshorts.com

SIGGRAPH 2005
31 JULY-4 AUG, L.A., USA
The 32nd SIGGRAPH festival is the biggest event in the industry calendar. George Lucas is giving this year's keynote address and Q&A session, and there's the usual line-up of must-see screenings, forums and talks. www.siggraph.org

Hexagon shapes up

SOFTWARE Eovia adds a novel new polygonal modelling application to its 3D software range – but what does it offer that isn't already available out there?

Eovia, the developer behind Carrara and Aimapi has added to its line-up with Hexagon, a brand-new poly and Sub-D surface modeller. At a price point of around £179/\$340/€263 Hexagon offers a new approach to 3D modelling, which Eovia has designed with clarity and simplicity for beginners and timesaving tools for experts, in mind. "Hexagon's unique selling points is that it offers multiple modelling techniques for different user levels," said Eovia's Stefan Blumberg. "Its tools make features available in an intelligent way. And this is an important point for the beginner: learners only need to use a few basic tools to start creating, and will have a feeling of success from the beginning."

Eovia also claims that Hexagon is the only modeller that "offers multiple modelling techniques at the same time"

with Subdivision modelling, surface modelling and advanced 3D tools such as Booleans, thickness, filleting and dynamic construction history offering advanced 3D artists ways to optimise their workflow. Hexagon works with low polygon techniques, supports UV mapping and exports to OBJ, 3DS, DXF, STL, DWG and Carrara formats.

But is the really an alternative? Carrara Blumberg says not. "Hexagon is fully integrated into the Carrara product line. It will be a companion to Carrara but also to other 3D apps, such as Bryce, Vue, and Strand, and used by people who might not need Carrara Plus, the next versions of Carrara will profit from Hexagon's technologies."

Hexagon will be available for Mac and PC. See the site below for demos and further details of the featureset. www.eovia.com



• Eovia's new modelling application, Hexagon, works with low polygon and Sub-D techniques, supports UV mapping and exports to OBJ, 3DS, DXF, STL, DWG and Carrara formats. The company says it offers beginners a rewarding intro to 3D, alongside pro tools for experts



Production line

The month's other releases in brief

MODO DEMO

Head over to Luxology's site to try out a free version of modo 1.02, its poly and Subdivision surface modeller. The evaluation version offers free, unrestricted access. President Brad Peebler says the company "trusts the user community". How refreshing. www.modo3d.com

MICROWAVE FOR MENTAL RAY

Evasion3D has released MicroWave, its 'futuristic projective rendering system', for mental ray. The app is designed to turn any 3D scene into real-time 3D content regardless of scene complexity, or shading features applied. Its RRP is \$499. www.evasion3d.com

ENDORPHIN RUSH

NaturalMotion has a new monthly licensing option for its dynamic motion synthesis application, endorphin. Entitled endorphin Rush, the programme will enable users to rent endorphin 2 for \$1,595 per month, full support is included in the price. www.naturalmotion.com

ALIENWARE MJ 12 7550A

Alienware's most powerful workstation to date has dual AMD Opteron processors, support for NVIDIA SLI. Graphics and a sleek new chassis design. The MJ 12 7550A features support for extremely clever dual PCI Express graphics. www.alienware.com

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- LW scheme for C4D

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www.maxon.net/lw



Projects round-up

Hair gremlins, retro 3D, motion graphics, preschool animation and hi-tech water

01 GLASSWORKS SUNSILK AD

The latest ad for Sunsilk shampoo gives the phrase 'bad hair day' new meaning, as three bizarre monsters play havoc with a woman's hair. Glassworks used its character animation and hair simulation skills on the ad, working from a character design by Star Wars artist Saigang Lee. "We used XSI with in-house software for the spikes on the spiky monster," says producer Jonathan Davies. "The biggest challenge, and the thing we spent most time on, was the design of the characters. Renders were long, but that isn't really a challenge other than a challenge of patience."

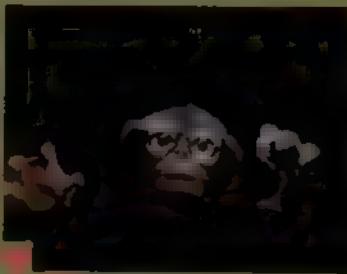
www.glassworks.co.uk



02 PLAID VIDEO BY GELMAN

CareerStick is the latest release from electronic maso Plaid, aka Ed Handley and Andy Turner. The entire 220-second video for the track 'CareerStick' is a continuously moving chainlink fence in 3D - both the CG variety and hybrid 2D. Stereoscopic kind. Director Alexander Gelman and his team used Maya, After Effects and smoke 'like artificial environments that don't try to mimic reality, environments that are confident enough to exist in their own right,' he says. 'At the same time, I was drawn by the kinda grotty low tech quality of anaglyphic 3D.'

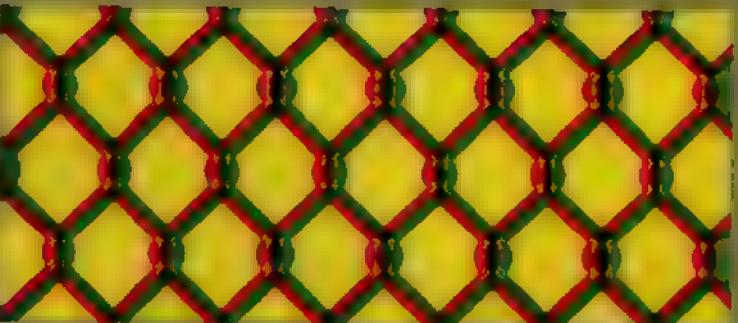
www.designmachine.net



03 ONYRO'S FISCHERSPOONER VIDEO PLAYED

The launch of Fisherspooner's latest album *Odyssey*, more than two years after their debut #1, has been accompanied by a flurry of publicity. As part of this, Greek design agency Onyro created a customised Flash media player for record label EMI, as well as a frenetic 3D sting of the band's logo indulging in some psychedelic lumbings. "We used Softimage/XSI for the rendering and animation, and then After Effects for loads of motion blurring and compositing," says Onyro's Creative Director, Ant Kyriazis.

www.onyro.com



04 BIRD BATH SERIES BY IMPOSSIBLE TV

Newly independent from previous owners Granada, Impossible TV is celebrating its freedom with a new series for preschoolers, *Bird Bath*. It consists of two 10-episode series for Channel Five and is due later this year. Despite the tight timeframe, Impossible TV's Peter Scott says the series is "more generous in schedule than anything we've made. *Bird Bath* is a more muted environment, and combined with the extra time, it means it looks top notch." The team is using 3ds max and character studio for the birds themselves, and Photoshop and After Effects for textures.

www.impossibletv.com



05 BANG & OLUFSEN AD CG BY ONE POST

Bang & Olufsen's newest TV spot, *Learn to Listen*, features a musician filling a glass of water by himself alone - because, as it turns out, he's blind. Directed by the Shammasian Brothers, at Godman, the ad blends high-speed footage filmed on a new ARRI camera and CG water droplets created at One Post. Head of 3D Dave Child was the lead: "We created the photo-real water droplets using Maya, and then Richie White composited these into the shots and gave them depth of field," he says. "They don't look synthetic, and we are very happy with that."

www.onepost.tv



A still from Ebenezer Morgan's *Photography Emporium* by Jaime Pardo and Tia Perkins. The duo were, in their own words, "let out of our gimp cupboard" for the SE3D showcase event



SE3D showcase

EVENT First fruits of experimental online Maya rendering service for indie animators screened at Bristol's Animated Encounters festival



Twelve teams of British animators were "let out of their gimp cupboards" at Bristol's recent Animated Encounters festival to preview an innovative new online service

intended to put the rendering power of a major CG studio into the hands of independent artists.

The films in the SE3D showcase, co-sponsored by HP and Alias, will be among the first products of HP Labs' new Maya Rendering Service, which functions as an out-of-house render farm

According to former Aardman animator Dan Lane, whose short, *Two Fellas*, was one of the few films in the showcase completed at the time of the screening "[The service] brings smaller companies into a different way of working. Instead of having to set up and maintain a whole load of kit, I can just call HP and rent it for a couple of weeks. Rendering then becomes a utility, like electricity or gas."

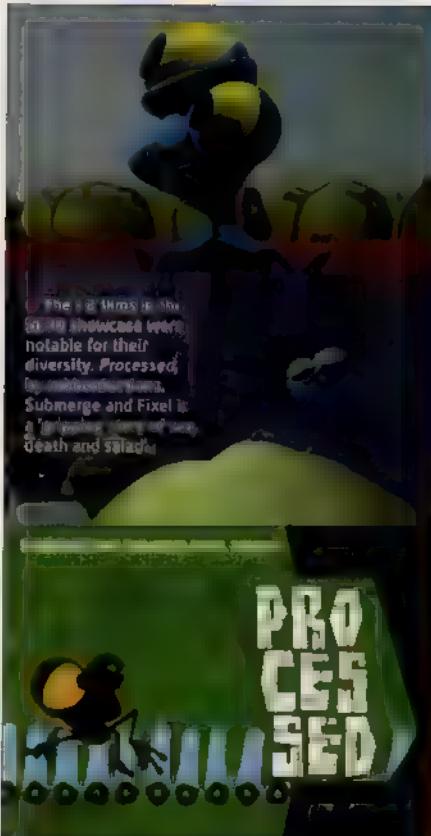
Unlike existing internet render services such as ResPower, the scheme works on a 'trickle bidding'

system, described by HP's Stephen Hinde as "a bit like eBay for computing". Time on the render farm is divided into one hour slots, for which animators tender bids for their projects. The sender of the highest offer gets their renders processed.

However, panellists who spoke at the show downplayed suggestions that this way of working would force animators to make creative choices based on purely financial criteria, comparing the process to that of booking slots for a studio's in-house facilities. "Ultimately, it's just a render farm," commented Lane, a long-time Maya animator. "It does exactly what it says on the tin."

The remaining short films in the SE3D showcase are now on course to be completed in time for screenings at the Cannes and Annecy festivals. At the time this issue went to press, neither HP nor Alias had confirmed a commercial roll-out for the service, which is described as "still very experimental". Back in the gimp cupboards then, chaps.

[w] www.dshed.net/se3d



Two Fellas, by Dan Lane: a surreal glimpse into the lives of 'sofa bachelors' Green and Yellow, and one of the first SE3D films completed.





I've spent 15 years in London and now seven years in LA, recently I spent another week in London. In the time I've been away, the number of people doing CG in Soho has gone from maybe two dozen to over 1,000. The facilities there are working on A-list Hollywood films, and doing first-class work. But there are interesting differences between the London studios and those of Hollywood.

Broadly it seems that the distinguishing characteristic of the large Hollywood facilities is a willingness to create their own tools. Whether they've been writing new renderers, new compositors, simulation tools or modeling tools, the thing that marks out places such as ILM, Digital Domain, Blue Sky and the rest is that they've spent lots of time and money creating their own technology both because they needed to and because they wanted to distinguish themselves from their competitors.

In London, however, apart from developing pipeline tools, everyone talked to seemed unwilling to support a staff devoted to creating custom technology - and the arguments for this. For one thing, it's easier to make money if you let other people do the open-ended work of software development. For another, there's arguably less incentive required now as the vast majority of the tools people need can be bought and programmed off-the-shelf while functionality keeps going up. Finally, many of the

Letter from Hollywood



Custom conundrum

Craig Zerouni of Side Effects asks: is London's dismissive attitude to custom software development a symptom of an inevitable trend - and will VFX become a commodity business?

London facilities grew up out of television post production houses, where there's absolutely no history of developing software. The TV model is to buy equipment, decorate the room, and start the meter rolling. Fans don't work like this - at least not yet. That may change, because the history of technology is that things go from difficult and expensive to cheap commodities. Consider the simple PC. Once they were expensive and profitable to sell. Now, they're cheap - and Dell seems able to make a profit selling them. Similarly, once upon a time only ILM could be trusted to produce feature film effects, so ILM could charge useful amounts of money. Now, studios are completely willing to trust studio guys in a garage to produce shots, and the pressure to make the process faster and cheaper is relentless. In a world like that, the television post production model may well turn out to be the winning strategy.

But are we there yet? While even the large Hollywood facilities have cut back on the amount of custom development they do, none of them feels secure enough to stop doing it altogether. It seems as if they're playing a longer game, and the name of that game is still to push for more spectacle. More things that people haven't seen before: more control for directors, while also attempting to go faster and charge less. Sony, for example, seems to be thinking not just about how to get through 2005 but about what it will need to achieve world domination at some point several years after that. And it's not just Sony: all of these companies are engaged in a struggle to stay out of a commodity business. If what you do is indistinguishable from what everyone else does, then you're only able to compete on price - and that's not a business model most people want to be part of.

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computer graphics

Chemical Brothers 'Believe'

The Chemical Brothers dance the body electric - and freak out a hallucinating worker - in a darkly comic promo starring a menacing robot created at Framestore CFC

The faceless nature of so many contemporary dance music artists has prompted record labels to turn to 3D animation and effects to add dynamism to their music videos. While the Chemical Brothers don't quite fit into the 'anonymous' category, they've done more than most to explore the possibilities of CG, most spectacularly in promos for the songs *Star Guitar*, *Get Yourself High* and *Hey Boy, Hey Girl*. Their latest addition to the list is *Believe*, a superb combination of live footage and CG elements created at Framestore CFC.

The promo follows a car plant worker as his mundane job and humdrum life dramatically clash when he starts to catch sight of a robotic armature from the factory running loose around the streets of London. With flawlessly integrated CG elements and frenetic hand held camerawork, the promo packs a powerful punch. Those energetic camera moves were made possible by the use of a DV video camera, and CG elements were inserted directly without the use of bluescreen.

"The Directors, Dom & Nic, really liked a test we created for a European Renault commercial, where we'd been able to shoot footage in the morning and then have CG in there by the afternoon," explains Jamie Isles, Senior Technical Director and Animator at Framestore CFC. "Using portable DV equipment rather than 35mm really gave them freedom. They could just go out and shoot what they wanted; all we needed was lighting ball reference to match into the scenes."

The use of DV did, however, make working in overcast conditions for much of the six day shoot something of an issue. "The plates initially looked quite bland," Isles says. "They lacked range, with an absence of strong blacks and extreme whites. It took some work to put that range in, to make everything appear more dynamic." Both a mirrorball and white ball were used for the lighting reference. "They didn't use proper high-dynamic range on this, just Maya Hypershade with five bracketed exposures from a fish-eye lens multiplied together," says Isles. "The reference data was really just a starting point, though. We had to get through four shots a day, so it was really just a case of adding whatever worked for each particular shot. In addition

to the image-based lighting we'd add a couple of lights to burn out the sky and add a bit of backlight, and then test to see what else was needed to match the objects into each scene, such as a little bit of rimlight." The team didn't get to visit the MG Rover plant eventually selected for the shoot (20 other factories refused to help out) until mid-way through the production schedule, so work began on the robot design a couple of weeks earlier. Isles says, "The final look of the main arm, which effectively forms the torso and head, came out of that trip. We also got some nice references to help add realism, including things like little warning signs to stick on the robot."

TECHNIQUE

Although the robot design evolved during the course of the project, a rig was built from the original roughly blocked model, enabling the animators to get working immediately. Texture detail - both hand-drawn and procedurally generated - was also added before the model was complete.

"As the model was getting close to finished I'd take it and place some UVs on it, placing dirt textures on the larger areas and adding detail on top for scratches," says Isles. "Sometimes it's difficult to get moving when things are still being fine-tuned, but we had good communication, and the rigging was very rigidly bound, so we were able to easily clip things in." With just two weeks to work on more than 30 CG-augmented shots, efficient compositing was also crucial. In fact just three passes were handed over - the beauty pass, the shadow pass, and a multi-light pass that gave extra grading control. By way of contrast, many of the studio's previous projects have involved up to 14 passes.

Had *Believe* been a million dollar affair, it would still have been remarkable. That such an engaging, visually convincing promo was produced with such pared-down filmmaking and post production techniques is nothing short of incredible.

You can watch the *Believe* video, read the credits and find out more about its production at [w] www.framestore-cfc.com/commercials/chemical_brothers/index.html

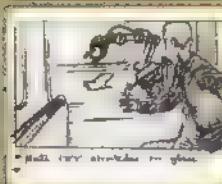
DETAILS	
TITLE	Believe
PRODUCTION COMPANY	Framestore CFC
DIRECTORS	Dom & Nic
RUNNING TIME	3 minutes
FIRST BROADCAST	July 2000
WEBSITE	www.framestore-cfc.com/commercials/chemical_brothers/index.html
TEAM SIZE	10 people
TIME TAKEN	Two weeks
SOFTWARE USED	Maya, Mental Ray, 3ds Max

FREEZE FRAME

A young man stares at leotard-clad dancers on a TV in a shop window. One of the girls, her face contorted, screams directly at him. Perturbed, he heads off to his job at a car plant. On his way home he sees one of the assembly robots from the factory drinking out of a river; back at home, the robot disappears as if it seems passed to strike, but when the man returns to the street several robots close in, beams of light shoot from traffic lights and buildings seem to tumble. The final shot sees the man sitting in the street, laughing maniacally.



How Framestore CFC bolted together its disturbingly life-like robotic hallucinations



01 The initial storyboard for a sequence in which the robot chases after a bus. "Because no bluescreen was needed, directors Dom & Nic could just go right out and shoot anything," says Jamie Isles. "DV also made things cost effective."

02 "We used Dirtmap occlusion in mental ray, adding procedural noise to create the look of oily dirt around any areas of contact," says Isles. "We thought about using procedural texturing, but the results would've been too clean."



03 "The robot was designed by Alex Doyle," says Isles. "Normally, the actual factory robot would provide the starting point, but he had to begin the design before any recce work was done, making a few changes after visiting the car plant."



04 A view of the robot in wireframe, with the cabling detail visible in dark blue. "The cabling at the rear was hand-animated, but for the cabling that wrapped around the robot we made use of Hoyo Hair," explains Isles.

05 "One of the animators came up with a run cycle where the robot sports a sort of injured wobble, which became the blueprint for the main run," says Isles. "In most of the scenes, the robot's animation is built on that cycle."



06 The menacing car plant robot model, fully lit and ready for motion blur. For this project Framestore CFC decided to pair Maya with mental ray. "For lighting reference we worked with a white ball and a mirrorball," says Isles.





Mental Roy

Resident columnist and 3D mental droid **Mental Roy** is puzzled. How has George Lucas's Jedi Mind Trick managed to persuade everyone that the new Star Wars films are anything more worthy than vapid vehicles for visual effects magic?



THE NEW STAR WARS It's just not very good is it? There - I've said it. And believe me, it takes the guts of a Princess Leia in Bounty Hunter Disguise [TM] to say that round these parts - it's an opinion that pretty much puts me in a minority of one. There are fans of *Star Trek*, and they are known as 'Trekkers'; there are fans of *Red Dwarf*, and they are known as 'Dwarfers'.

There are even, it is rumoured, fans of *Firefly*, and they are known as 'Wankers'. And then there are fans of *Star Wars*, and they are known as 'the ewok 3D animation community'. Yet it's plain to see these *Star Wars* fans are easily impressed, and that they'll be back - in greater numbers.

Don't get me wrong, I don't hate *Star Wars*. I grew up with it. I had Yoda's face on my lunchbox, for crying out loud; and jedi mastery notwithstanding, can you imagine anything more likely to put you off your Peppermint? But since the phenomenal success of the first three films, has no-one had the balls to say: "George... could the lads just have a quiet word?" As the trilogy is at pains to point out, the greater your power and the more expansive your Empire, the more clouded your judgement becomes. And yet the warning signs were there all along - the Care Bear flights, the tacky ending, Frank Sidebottom piloting the Millennium Falcon...

And they're JUST FILMS. They're not life events. They're not something you should sit around discussing in the pub afterwards for hour after sodding hour. You want evidence? Let's leap back six years. Episode I has just opened in London. Half of Soho crams into the Odeon Leicester Square to see it. The curtains open, the credits roll, the music plays and then... The Phantom Menace sputters apologetically across our retinas.

WHEN THE SITH FINALLY HITS THE FANS, I'LL BE ELSEWHERE

Rarely has such frenzied anticipation given way to a more overwhelming feeling of steady disappointment - even in Solo's darkened rooms. And since so many insults have been heaped on Jar Jar Binks, it'd be pointless to invent new ones for the FLOPPY-EARED STEREOTYPE. So let's recall some highlights from the rest of the movie instead. Those dog-on-a-string-haired Jedi Knights. That droid army resembling a toilet brush that 'cleans below the rim'. The Sith Lord with a ludicrous spray-on tiger face. Yoda's sideburns. The s-l-o-w exposition. The hokey religion. Ewan McGuinness. What tripe.

Okay, so the second movie is better. But it's not War and Peace - which, by the way, they managed to film in under 210 minutes. *Star Wars* is up to 165 so far, and it's STILL... not... DONE yet. And all the digital wizardry on Dagobah can't hide the fact that Episodes I and II are expensive in-game cutscenes in search of a plot. Clearly, only two groups of people needed the backstory from the original trilogy filling in for them: obsessives and toy makers. And I don't particularly want to hang out with either of them.

Ask yourselves: how much job satisfaction can there be in crafting a finely nuanced character animation or a revolutionary new particle shader, when at the back of your mind there's the nagging suspicion that all the filmmakers actually need to do is like a couple of overpaid British thespians, give them ninja glowsticks, sit back and watch people queue around the block to see the results. Just because it's *Star Wars*.

When the Sith finally hits the fans, I'll be elsewhere. And when I do see Episode III, it'll be on TV at Christmas, after mum's lightsabred the turkey, but before the row over who the father of Cousin Tracey's baby is. "Tracey... there is another..." And then, like Cousin Tracey's baby, we're not going to talk about it again. For a very long time.

PLUGGED IN

CONTROL

Videogames of the future could directly alter your brain cortex to induce sensory experiences - that's the inference that many reporters are making, based on a recent U.S. patent granted to Sony. Any devices based on the techniques in the patent would have huge and wide-ranging potential, not least for those people who are blind or deaf.

[w] www.sony.com



GLOBAL ILLUMINATION #02

Key stats and trends from the 3D industry in specific countries. This issue:

The cost of labour in China is one of the lowest in the world. This, coupled with the territory's large pool of animators, is attracting animation outsourcing to China. In fact, the country probably has the largest number of animators in the world, and the country is attracting large numbers of post production jobs. The largest studios in the country are Wang Film, and Hong Ying, both based in Suzhou, the pair are actually Taiwan-based animation studios with large scale operations in China. Other large studios include Shanghai Animation, Shanghai Morning Sun Animation Services Hong Kong, Jiaji Animation and Co or and Animotion.

However, due to the lack of supply of local content, the Chinese TV channels are reliant on imported animation content, and Japanese animation productions rank highest in popularity. The other popular animation programmes include Hollywood productions such as *Tom & Jerry*, *Mickey Mouse*, *Donald Duck* and so on. The quality of homegrown Chinese animation content is an area of concern and hence Chinese animation is not yet as popular with the viewers as the various imported animation shows.

- About 20,000 minutes of animated films and TV programs are produced by animation studios in China

- In China, there are about eight medium to large studios as well as about 100 small studios

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◆ The platoon de résistance of *Star Wars: Episode III* is the Jedi-hunting droid army commander General Grievous; an all-CG cyborg, and a kind of beta version of the wicked Darth Vader.

FACTFILE

Episodes

SELECTED CREDITS

SELECTED CREDITS

The *Wall Street Journal*
The *New York Times*
The *Washington Post*
The *Financial Times*
The *Moscow Times*
2001, 2002, 2003
Journalist Award at the
World Press Photo
Excellence in the Best
Five Journalists of the
Year 2001, *English*
and American

100

PROJECT

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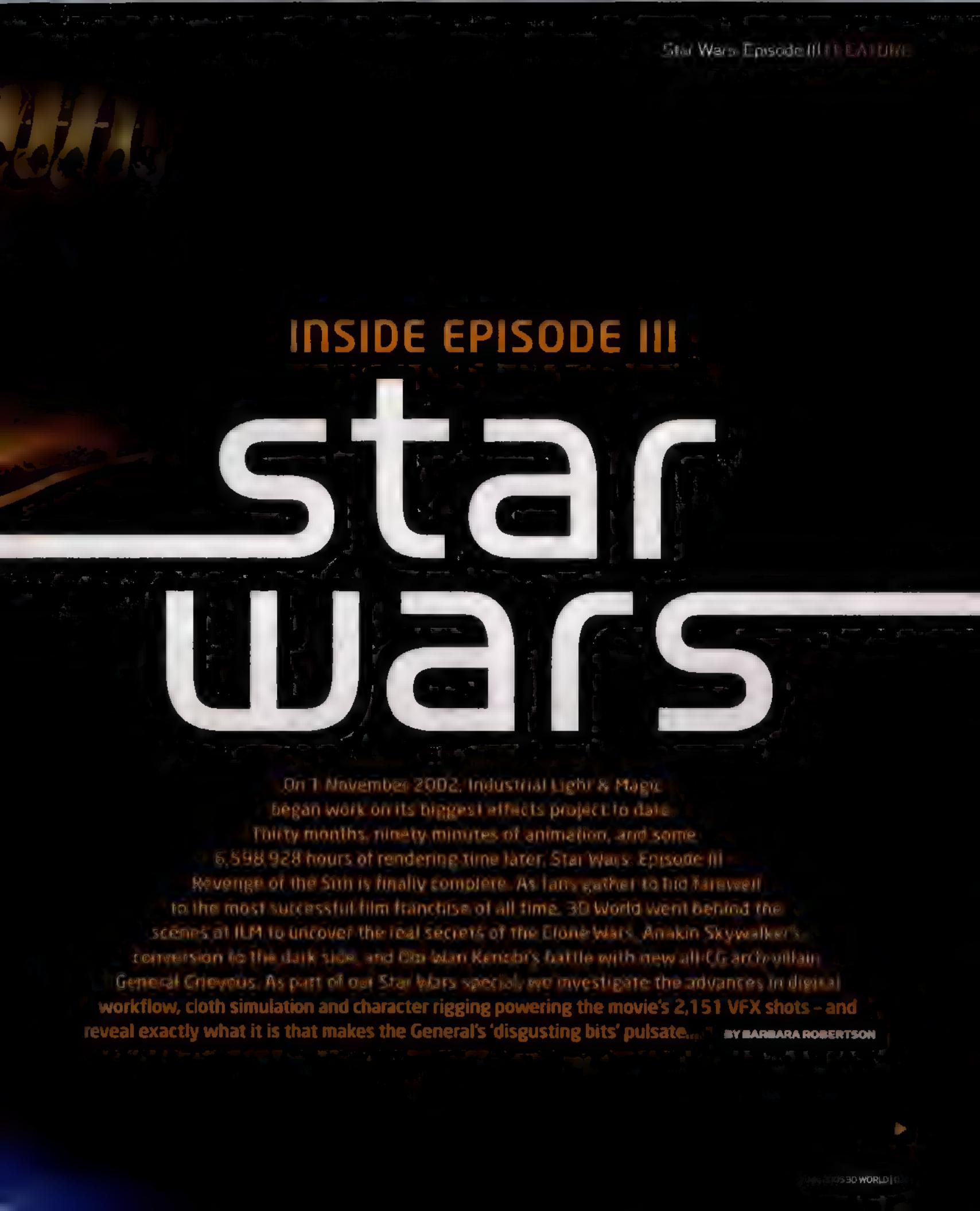
PROJECT TE

A bar chart comparing the population of the United States and Mexico. The y-axis represents millions of people, ranging from 0 to 300. The x-axis lists the two countries. The bars show the US population at approximately 315 million and Mexico's at approximately 125 million.

Country	Population (in millions)
United States	~315
Mexico	~125



INSIDE EPISODE III



Star Wars

On 1 November 2002, Industrial Light & Magic began work on its biggest effects project to date. Thirty months, ninety minutes of animation, and some 6,598,928 hours of rendering time later, Star Wars: Episode III – Revenge of the Sith is finally complete. As fans gather to bid farewell to the most successful film franchise of all time, 3D World went behind the scenes at ILM to uncover the real secrets of the Clone Wars, Anakin Skywalker's conversion to the dark side, and Obi-Wan Kenobi's battle with new all-CG arch-villain General Grievous. As part of our Star Wars special, we investigate the advances in digital workflow, cloth simulation and character rigging powering the movie's 2,151 VFX shots – and reveal exactly what it is that makes the General's 'disgusting bits' pulsate... BY BARBARA ROBERTSON

The opening space battle is the longest of any Star Wars episode, and includes, for the first time, huge ships in addition to small fighters.

"Of the 2,000-odd visual effects shots in Episode III, over 1,000 include animation. We've passed the length of an animated feature!"

ROB COLEMAN, ANIMATION DIRECTOR

the first, the 1977 film now named *Star Wars: Episode IV – A New Hope*. All told, the first five Episodes have won three Oscars, one BAFTA, and two Oscar nominations for best visual effects. All of these effects were crafted at Lucas' own studio, Industrial Light & Magic (ILM), an unbroken track record that has been continued with *Episode III*.

A script developed within Maya automatically placed pilots in position, and constrained the character rig so that a pilot's hand moved with the steering mechanism.

With *Episode I – The Phantom Menace* (the first in the new trilogy of films) Lucas began pushing ILM to create record numbers of digital characters and scenes. For it, the studio completed nearly 2,000 shots, many of which involved multiple CG characters; a record number at the time. As Lucas moved into digital cinema with *Episode II – Attack of the Clones*, the effects grew to include more sophisticated digital doubles and a digital version of Yoda, originally a puppet controlled by the legendary Frank Oz. *Episode III* brings Yoda closer to camera, adds even more digital doubles and environments, casts new types of clones and droids, and re-introduces digital versions of characters from earlier films, such as the Wookies. The *pièce de résistance*, however, is the movie's arch villain: the four-armed, all-CG General Grievous. A "twisted welding of flesh and metal", the Jedi-hunting Grievous is not merely a formidable foe for Obi-Wan and his allies, but a major technical achievement.

The increasing scope of the digital effects has also led to an increase in total screen time for CG animation. Where *Episode I* contained 60 minutes of animation, *Episode II* had 70 minutes, and *Episode III* contains a full 90 minutes: "We've passed the length of an animated feature," says Animation Director Rob Coleman. "Of the 2,000-odd [visual effects] shots, over 1,000 include animation." At the peak of the work, which fell during the spring and summer of 2004, 40 animators worked on the shots; during the rest of production the number ranged between 30 and 33. All told, around 185 digital creatures appear in the movie.

And yet, unlike the previous films, the technical challenges of *Episode III* weren't primarily novel: "This time, we haven't had as many cases where we hadn't done something before," says Visual Effects Supervisor John Knoll, who managed 1,700 of the 2,151 VFX shots. "The challenges have been in doing things more efficiently while retaining the quality of the work."

DUPLICATE DOUBLES

James Teeley, who oversaw rigging for the creatures, spaceships, and props, was at the centre of this efficiency drive. It was his crew that devised tools to ready characters for animation as quickly as possible. This included both new characters and the returning stars: although the crew repurposed models for digital doubles of the actors re-appearing in this film, the models still had to be re-rigged.



IN FOCUS |

N

to the digital side...

during his battle against Sidious. When he was in control, the team used the movement of the cloak to reflect this; when he was losing, the cloak became frayed, flapping around, falling off him and working

special shaders created by the team's visual effects look. "They glued little bits of [digital] hair to the cloth," says Ferguson. "All the refinements, one of Yoda's crucialistics, the underlying structure of remained largely unchanged - for reasons: He's pretty much a 'model' reveals rigging guru Tooley. "He wanted to reuse some of

"We now have a very different approach to the way we control animation and work with motion capture than for creatures like Jar Jar in Episode I," says Creature Supervisor Aaron Ferguson. "Plus, we used Softimage|3D 3.5 on Episode II and now we're using Maya and in-house tools." And no matter whether the creature was new or one that had appeared in a previous film, the animators wanted to use the constraints, FK and IK blending, interaction with rigid body simulations, and so forth in the newer software. The old rigs wouldn't do.

"We tried to streamline all the digital doubles so that when we were ready to build a creature, we could push a button and get all the bones," says Tooley. "They would then move into position inside the geometry, completely rigged and ready to go. As long as the character was bipedal, it would work. It even worked for some of the new clones."

For an interface, the crew used photographs of the creature or character being built; each had its own GUI generator. The character was pictured on screen with icons on the side that allowed the crew to make detailed adjustments: "Other companies do similar things, but we built our own version [of the interface]," says Tooley. "We take a front view from any rendered turntable, or a photo of a maquette, or a photo of an actor; any kind of 2D pixels. Then we drag boxes onto the photos that give the user buttons. When someone using the system taps on a button, code is activated that automatically selects particular control mechanisms, and switches to rotation and translation automatically."

Because the space battle happens in the atmosphere above Coruscant rather than in outer space, it's the first to have fiery explosions



Although some live-action elements were incorporated into the composites, the space battle sequence is almost entirely CG

Because the opening space battle sequence featured hundreds of ships, ILM developed an "auto-pillor" system that paired the fighters with crews



Because the characters are symmetrical, the crew could move the pivot points on only half the body - the left shoulder and knee, for example - and apply the result to the other half automatically. Once the pivot points were repositioned, thus positioning the bones, a TD could hit a button and all the rigging and IK solvers would pop on automatically. "We'd start with Obi-Wan's geometry, his size and shape, and then move the pivot points to fit Anakin, and the other characters," says Tooley.

"With a movie like Star Wars: Episode III, people come onto the crew with fond childhood memories and a real excitement about the film. We don't have to work to build a culture - they're passionate and interested in doing it right."

- RAYMOND FERGUSON, THEATRE DESIGNER

The TDs used the same system to rig the various types of clones. The skinning for the characters was integrated into Maya so that what the animator saw would match what later emerged at the other end of the production pipeline. This was important because in Episode III, the clone troopers on each planet have distinctive armour and weaponry and speciality clones such as paratroopers.

Droids were animated with motion capture data until 'sliced and diced', then had body simulations applied



Yoda's model was "repurposed" from Episode II; however, his skin was improved using new lighting tools such as Subsurface Scattering.

and pilots had different uniforms. The pilots' uniforms, for example, were equipped with hoses similar to those of the fighter pilots in Episode IV.

As with the digital doubles, the clones were animated with the help of motion-capture data. New tools and techniques enabled the crew to apply walk cycles from one clone to many others: "Certain parts of the rig let us refit motion-capture to a variety of creatures," says Ferguson. "We wanted to be able to fill scenes with people doing interesting things without spending a huge amount of time and energy." Previously, because the models didn't share structural or naming conventions, most animations had to be created individually.

THE BEGINNING OF THE END

Episode III opens with a huge space battle, which, at 2,000 frames, is the longest shot in the movie. Unlike previous episodes in the saga, the sequence actually shows mile-long ships engaging each other in combat - and the sequence is entirely computer-generated.

Tim Naylor, the chaining lead for the movie (who developed the photo-based rigging GUI) also developed a system for quickly populating spaceships with pilots. "We had hundreds of ships so we had to crew them in a quick and simple way," says Tooley. With the scripts Naylor created, TDs could import characters as needed into Maya, click a button and see which characters were in a particular shot during the battle. The system knew which pilots belonged in which spaceships, put them into position into a default pose, and constrained them so that when a steering



IN FOCUS | Grievous bodily charm: the making of a Jedi-hunter



Grievous was in various stages - in a crouch, sitting upright, and on his hands with his legs in the air, so rigging accommodated pistons and levers that needed to work in unison. The intricate rig gave animators control of his 200 articulating joints.

The skull-like quality of General Grievous's head was partly due to the use of ILM's award-winning subsurface scattering rendering algorithms. Grievous's lack of facial features meant that animators relied on posing to convey emotion.



Grievous's torso and chest has a glass sack suspended inside that contains his organic structure - the lungs and tubes that keep him alive. Dynamic simulations give his guts, neck tubes and eyes a more organic look and feel.



The character was rigged to have flexible arms in various shots. The rigs were constrained to move the body around along his arms automatically so that no interpenetration occurred as animators twisted his body.

The model was designed so that using a rigid rigid-body simulation could animate parts that had been set off. The model was made of 4,358 NURBS surfaces and a total of 495,186 CVs.



The cloth simulation team hooked the General's cape on spikes sticking out from his elbows to make him more menacing. They used a system of constraints called 'digital Velcro' to pull it as the character moved his hand.

A

Insect-like biped, the evil General Grievous looks as if it's made of old ivory, while his body is a disturbing hybrid of soft intestine-like guts and hard piston-like joints. A bounty hunter preying on Jedi, the all-digital General plays a major role in Episode III and played an equally major role during production.

"General Grievous was by far our most complicated character," says James Tooley, who oversaw the character rigging. "The model was made to look cool, and his look was very specific. We couldn't change the geometry." This created something of a problem for the rigging team, as Grievous's posture changes dramatically throughout the film. In early scenes, he is hunched over, exposing only two of his four arms: a meek yet sinister presence. But when he fights Obi-Wan, he straightens up, revealing all his limbs.

Each section of his armour had to move independently, so there were no interpenetrations as he twisted his body around when animators put him into poses," says Tooley. "He had lots of articulating bits. The pieces of his body that get cut apart also had to be set up for rigid-body simulations."

In contrast, the soft organic parts of Grievous's body were animated procedurally, using simulations. "He has a glass sack inside his chest that's suspended in some sort of fluid," says Creature Simulation Supervisor Juan Luis Sanchez. "It was built to look like lungs and has tubes that keep him alive. We wanted to see them pulsating and looking disgusting."

A cloth simulation engine made the disgusting bits pulse. "We basically built a polymesh for the pieces of geometry inside him," says Sanchez. To control the simulation, the crew used tools called 'tacks,' which

affect the dynamics in particular areas of the polymesh. Painted texture maps positioned the tacks and described the area they encompassed. "It looks extremely gross," says Sanchez. "Because we simulate them all together, we use a self-propulsion method that keeps the meshes from intersecting with themselves, and that makes them jostle each other as they're pulsating."

And if the awkward armour, two hidden arms, and pulsating guts weren't enough for the production crew, the creature also wore a cape. Initially, the cloth dragged on the ground when Grievous hunched over, making him look like "a kid playing dress-up."

To make him more sinister, the crew took advantage of the angular spikes that stick out from his elbows. "We found if we hooked the cape over them, it allowed you to see his body," says Sanchez. "He looked like a general and you could see the menace."

Yoda and the Wookies meet on Kashyyyk, the Wookies' home planet. In this image, the Wookies aren't computer generated; Yoda and the landscape are.

"Certain parts of the rig let us refill motion capture to a variety of creatures. We wanted to be able to fill scenes with people doing interesting things without spending a huge amount of time and energy."

AARON FERGUSON, CREATURE SUPERVISOR

mechanism moved, the pilot's hand would move, too. In addition to the special pilot rigs, the chaining crew created rigging subscripts that helped them quickly build lightsabers and blasters for the clone troopers and other characters. "Lightsabers have special constraints," says Tooley. "Animators could animate a hand and have the lightsaber follow, or do the opposite. Sometimes, one character dropped a weapon and another picked it up. So, even though part of the character was constrained in one way, he could still let the weapon go and another character could grab it in the same shot." Sometimes, even a live-action character would pick up the weapon.

BREAKING UP IS HARD TO DO

To make matters more complicated, both the ships and the battle droid models had to be constructed in such a way that

Throughout most of the film, the lightsabers are CG attached to real handles. The droid's model was pre-scored so that it would break apart correctly.

they could be broken apart during the combat scenes - a process that couldn't be easily achieved solely by procedural techniques.

"We're working on a long-term project to automatically generate scoring using a mechanism based on forces, but that's complicated, especially with twisted metal," says Tooley. "It's a major task figuring out how all the things are supposed to crack and crumble automatically. So we prescore the models."

Each droid model that would "go dynamic," as Tooley puts it, was prescored in seven or eight different ways so it would break apart predictably in combat. The battle droids were animated using motion-capture cycles until they were chopped and sliced, then rigid body simulations sent the pieces crashing to the floor.

Characters wearing clothes, however, created new problems. Slicing CG cloth and having it react properly during a rigid body simulation was a particular challenge during shots in which General Grievous's guard is decapitated. "There was the question of whether we'd only have rigid characters with no clothing and clothed creatures that didn't get chopped or become rigid," says Creature Simulation Supervisor Juan Luis Sanchez. "Running rigid body simulations on animation in isolation is not groundbreaking, but putting cloth simulations together with rigid body simulations was a challenge. We had to chop the clothing at an exact spot and make sure the pieces would fly."

The solution, for the most part, was to split the shot into two parts - one pre-chop, the other post-chop. "Mostly, [we] would animate the creature to the point where it lost its head," says Sanchez. "We'd chop the head off and do a rigid body



Digital matte painters created establishing shots for the scenery of all the planets in the film, using 3D geometry and projected texture maps.

IN FOCUS | Obi one, Grievous nil: the anatomy of ILM's greenscreen fight sequences



General Grievous isn't just a cool-looking model; he's a four-armed, bounty-hunting Jedi-killing machine. For the character's crucial battle sequence with Obi-Wan Kenobi, ILM combined greenscreen footage, multiple render passes, and a little compositing wizardry to integrate Grievous convincingly with the live actors and the digital background.



01 Ewan McGregor was filmed fighting a man in a blue suit on a greenscreen stage. During principal photography, the blue-suited man gave McGregor someone to perform with and provided reference material for the team. But reference footage could only go so far: the General's second pair of lightsabers - and the arms that wielded them - were entirely down to the animators' skill.



02 Matchmoving determined the position of the characters relative to the camera. 3D meshes that moved with the filmed actors helped the animators block out the moves that General Grievous would make during his fight with Obi-Wan, before the low-resolution model was dropped into place in order to refine the basic movements.



03 For speed and ease of animation, the animators worked with low-resolution versions of the models - something particularly important with a character as complex as Grievous, whose model contains 4,551 NURBS surfaces. Intricate rigs provided control of the evil creature's 200 joints.



04 Because the fight takes place in a digital environment that was particularly render intensive, the background droids were animated and rendered as separate elements. As before, droid performances were based on mo-cap cycles up to the point where they were cut up; after that, a dynamic simulation was used on their parts.



05 Although in most other shots the lightsabers are CG elements, for this final shot, it was down to compositor Eddie Pasquarello made them glow. The use of Sony SRW-1 and SRW-5000 model VTRs that store HD Images in an 4:4:4 RGB format, which supports 10-bit colour, made greenscreen extractions more precise.

simulation on that, and the cloth around the head would tumble with the head. The other piece of cloth would stay with the body. We'd have a single polymesh in the first part of the shot, and then two meshes, one for each piece, in the second."

CLOTH CAPERS

ILM's cloth simulation engine works by moving the cloth polymesh when it collides with the volumes that make up a character. Most of these were rigid; some were scaled with muscles. "We made the volumes soft or hard depending on the situation," says Sanchez. "With extremely fast motions, we made the volumes impenetrable."

Changes to the cloth simulation methodology helped speed up the process - an individual sleeve could be re-simulated without needing to recalculate the rest of the garment's motion. Although ILM describes it as "not leaps-and-bounds different" to the version used in previous movies, the solver was also tweaked, making it easier for the TDs to perform simulations.



IN FOCUS | Building the Boga: how ILM solved its heaviest technical challenge of the movie

Episode III's largest new creature is the Boga, a giant lizard that Obi-Wan rides. But the main technical challenge posed by the creature wasn't its size. Unlike terrestrial reptiles, the Boga has feathers - a ruff around its neck, and feathers on its tail.

An arsenal of procedural techniques were employed for the animation: flesh simulation to sell the impact of the Boga's feet hitting the ground; a simulation to slide the skin over its rippling muscles, and feathers that would react to the moving flesh, but could be controlled by animators.

Because it took 4GB of RAM to load the lizard into shots, the simulations were run in layers: "We'd run the flesh, skin and feathers as separate passes because it was easier on CPUs and memory," says Creature Supervisor Erin Ferguson. "It was painful, but the sims ran quickly." A new flesh simulation engine called phys-bam-flesh, written by Ryan Kautzman, pumped out

frametime simulations. The Boga's feathers up and down to create emotional reactions. A dynamic camera follows the action, measuring fluttering frequencies.

rippling muscles in 6-14 seconds per frame, using volumetric areas inside the model to represent bone mass.

On top of the flesh, another simulation moved the skin, allowing it to slip over and against the muscles. "The skin has a new feature that lets you loosen it up," says Ferguson. "You could set a parameter that determined

how loose the skin would be on the surface, which created some folds."

The skin then drove the surface onto which the feathers were attached. "It was challenging because the core [of the feather] had to be a rigid piece surrounded by something loose," says Juan Luis Sanchez. "Sometimes we'd push the softness to sell the feathers,

other times we stiffened the core." Of course, this being Star Wars, a single four-ton feathered lizard could seem like an understatement. To create some company for the beast, the team mixed and matched slight variations in body shapes and texture paintings. The result was not one, but several - and all without a feather out of place.

"In Episode II, the question was whether we could have digital doubles of the actors for the stunts. This time there was no question."

JUAN LUIS SANCHEZ, CREATURE SIMULATION SUPERVISOR

Because the simulation engine had been well used prior to Episode III, ILM was able to use the technology in artistic, rather than merely functional, ways. "Cloth could be part of the creative process, not just a technical bottleneck," says Sanchez. "It wasn't just a case of making it sit on the character."

This was especially true for Yoda [see boxout: 'From puppet to pixels: Yoda's journey to the digital side']. "In Episode II, we got a nice look [to Yoda's cloak]," says Sanchez. "It looked real. It didn't get caught around his ears. So, in this movie I was interested in what more we could do with it."

Other old familiar faces from Star Wars' past posed a rather different technical challenge. In Episode III, we get to see the Wookies on their own planet, Kashyyyk. More than one Wookie meant more than one character with long fur, and since they were

© George Lucas Filmed in monitor technology for Industrial Light & Magic's visual effects department, Lucasfilm, California, USA



© The actor in this scene was filmed on a greenscreen stage. Everything else - droids, ships, backgrounds - was created at Industrial Light & Magic



a mixture of digital creations and costumed actors, the digital far had to match that seen in live plates.

"We found we were able to leverage the technology we developed for *Van Helsing*," says Ferguson, "but in this film, there were so many of them. Hundreds upon hundreds running around; we couldn't take the same amount of time per shot as we did with *Van Helsing's* werewolves."

By repurposing hair simulations, the sims remained usable even when the animation changed from one of the ten different motion-capture cycles to another. "We ran hair simulations on all the Wookie cycles," says Ferguson. "They were calculated in skin deformation and saved in local skin deformation space, so if the skin deformation changed, the hair would change with it. The animators could take those cycles and blend them together and we wouldn't have to re-run the hair simulation."

To animate the Wookies' bandoliers, the team used the cloth engine. The technology also found itself pressed into service for a surprising range of other tasks, ranging from the plants on one planet, to the feathers on the Boga – a giant lizard Obi-Wan rides – to General Grievous' guts [see boxout: 'Grievous bodily charms the creation of the Jedi-hunter'].

Cloth simulation also played a major part in making the digital doubles convincing. "In Episode II, the question was whether we could have digital doubles of the actors for the stunts," says Sanchez. "This time, there was no question. In Episode II, we split a performance halfway through a shot once or twice. In this film, we did that a lot more."

"Halfway through a shot, an actor might be walking or flying, and go from CG to live action and back," he adds. "Sometimes we'd preserve the live action head and create a digital body. We knew it would hold up; we were much more confident this time around."

SUCH SWEET SO AIRY

Despite its obvious pride in its work, after 30 months, 375,040 frames and nearly 13 million individual renders and composites, you could forgive ILM for being glad just to get the job out of the door. But now the saga has come to an end, the effects team have mixed feelings. With the *Star Wars* franchise spread over three decades, many who worked on *Episode III* saw *Episode IV* as children. So for many, saying goodbye to the saga means saying goodbye to a part of their childhood.



"Halfway through a shot, an actor might go from CG to live action and back. We knew the results would hold up; we were much more confident this time around."

JUAN LUIS SÁNCHEZ, CREATURE SIMULATION SUPERVISOR

"With a movie like *Star Wars*, people come onto the crew with fond childhood memories and a real excitement about the film," says Ferguson. "We don't have to build a culture – they're passionate and interested in doing it right. We had an amazing team that was great to work with. And for that reason, it'll be sad to see it go."

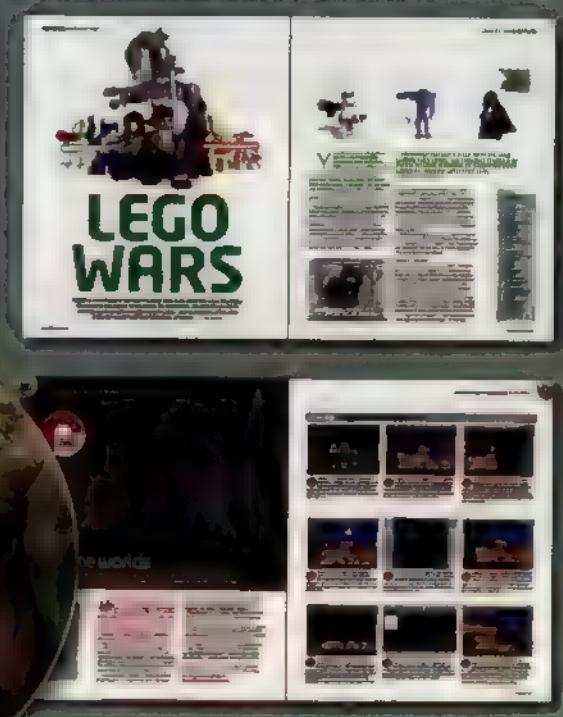
A sentiment that will no doubt be shared by millions of fans across the globe – many of whom are active within the CG community. With the Clone Wars at an end, Anakin Skywalker returned to the dark side, and the loose ends of the plot tied up, there remains only one question: with no more new *Star Wars* movies to look forward to, what will 3D artists find to talk about at the pub?

Star Wars: Episode III - Revenge of the Sith opens in both the US and the UK on 19 May, and will be screened worldwide the following day. For more information, see the official website: www.starwars.com

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all in the eyes

Tired of seeing CG characters with cold, dead eyes? Master this robust, production-proven facial rigging system, and you'll soon be animating the winks, blinks and glances that really bring a 3D model to life

BY ROB CAZIN

FACTFILE

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Two hours

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• Demo animation
• Pre-built expressions

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N/A

There are many who argue that the art of 3D character animation is now entering its golden age. The ever increasing quality of animated movies such as *Shrek* and *The Incredibles* has created an escalating demand not only for stunning visual effects, but for engaging stories. And, for the story to work, audiences of all ages need to see 3D characters that they can relate to and believe in.

Of all the body's points of communication, the face is the most important, and also the most subtle. Because of this, its features are the most difficult parts of a character to animate convincingly - and none more so than the eyes. Creating realistic eye movement is an essential element of getting the face right, but eye and eyelid animation presents animators with an extremely complex challenge: melding voluntary (point of focus, involuntary (expression) and automatic (blinking) movement.

Until recently hardware and software limitations have prohibited the widespread application of complex facial rigs that could simplify the approach animators took to marrying these motions. Now however high-end 3D software packages such as Softimage/XSI are designed to provide a toolkit for the creation of complex custom

rigs. With careful planning, rigs can be designed that provide animators with an intuitive workflow and help them to achieve consistently successful results.

MEET BUSTER

At Sol Animation we've developed a simple yet very powerful eye rig control system that intuitively balances manual and automatic deformation. The rig, as it's presented in this tutorial, is currently being used in the production of an original HD short featuring Buster, the character shown on the right. A simplified version of the model is featured on the CD. Earlier versions of the rig were developed for our award-winning History Channel animated shorts, and stills from these shorts are also included on the disc.

Once you've mastered this technique you'll be able to apply it to any character or creature to create natural eye movement that will really help to bring your creations to life.

Rob Cazin is President and founder of Sol Animation. Since 1991 his company has produced award-winning character animation for the advertising and entertainment industries [www.so-animation.com]



Bust originally designed and
modelled by Tomas Andreasson



STAGE ONE | Create a constraint system



01 Begin by opening the scene `eye-rig-start scn` included on the CD. Create a primitive Implicit square of length 0.05. Translate it to 0, 0.37, 1.6, and scale it in the Front viewport to roughly span the areas of Buster's eyes. Name this 'lookat' and parent it under Buster.

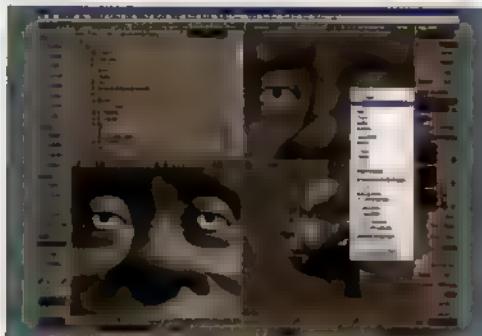


02 Create a primitive null and parent it to lookat, translating it to 0,0,0 locally. Scale it uniformly to fit within lookat. Translate it to the right, roughly centred on the left eye, using the Front view. The position doesn't have to be perfect, as we'll be using constraint compensation later on.



03 Rename the null 'left' and duplicate it. Rename the duplicate 'left_upv' and translate in Y to just above lookat. Select both nulls and duplicate, translating in X to the opposite side of the square. Name these nulls 'right' and 'right_upv' respectively.

STAGE TWO | Constraining the eyes and setting a neutral pose



04 Highlight the CnsComp button. Expand the HEAD node located under Buster and select the eyevector_left null. Apply a directional constraint (Constrain > Direction). Pick the 'left' null. Click the Up Vector tab in the Properties window and click on Pick New, choosing the left_upv null. Repeat these steps for the right eye vector using the right nulls.

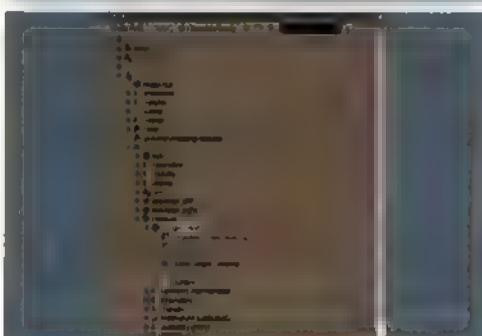


05 Un-highlight the CnsComp button. To establish a neutral pose for the lookat hierarchy, select the lookat object and set a neutral pose (Transform > Set Neutral Pose). Hit the Selection button and click the Local Transform icon. Click on the Pos. Limit tab and check Z Active for minimum and maximum, setting both to 0; this permits movement on X and Y only - the only axes we need.



06 Now that our lookat target is zeroed out, let's see how the constraints behave. Move the lookat around and Buster's eyes should follow. This particular setup is optimised to have a range of -1 to +1 on both axes. If everything is working, set its translation back to zero and proceed to the next step.

STAGE THREE | Creating the upper eyelid clusters



07 In the User viewport, frame all (hit [A]) to see all the objects in the scene. In the Explorer viewport, expand Buster > HEAD > HeadGeo > Polygon Mesh. The clusters will be located under the Polygon Mesh property.



08 Select the Head geometry by picking it interactively in the User viewport. Click on the User viewport's Camera icon and choose Isolate Selection. This is a nice way to interact with a model without obstruction by the other elements in the scene.

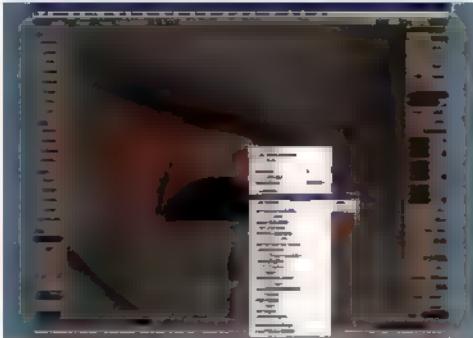


09 Select the polygons for the upper eyelid, using the image as a guide. You should select a wide enough range to allow stretching of adjacent areas. You should experiment with this range in future applications, since you'll probably be combining these shapes with other facial deformations.

STAGE THREE (Continued) | Creating the upper eyelid clusters



10 Be sure to include the polygons that wrap to the inside of the lid. One way of doing this is to select ([U]) and frame ([F]) a group of polygons to orbit and navigate within the area of the interior. You could also rectangle select ([Y]) the polygons from the front view with the viewport display mode set to Wireframe. Then remove the polygons that were selected on the back of the head.



11 Once you've selected exactly the polygons you want to include in your cluster, [Alt]+right click over the selected polygons to bring up the contextual menu and choose Select Adjacent Points. This is a quick way of selecting points without tagging, and also makes selecting a uniform area much easier.



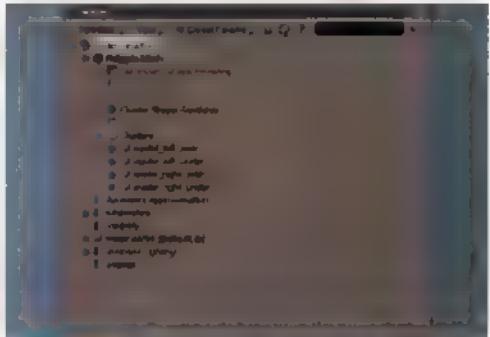
12 With the points now highlighted, hit the Cluster button at the bottom of the Main Command Area. In your Explorer viewport, expand Buster > HEAD and select HeadGeo. Under the Polygon Mesh node, open the Clusters folder. Rename the cluster 'eyelid_left_over'.



13 As with the upper eyelid, select the polygons for the lower eyelid, referring to the image as a guide. To allow for stretching of the adjacent area, include the area just beyond what you would normally define as the lower lid and do the same with the upper lid, bearing in mind the intended range of influence.

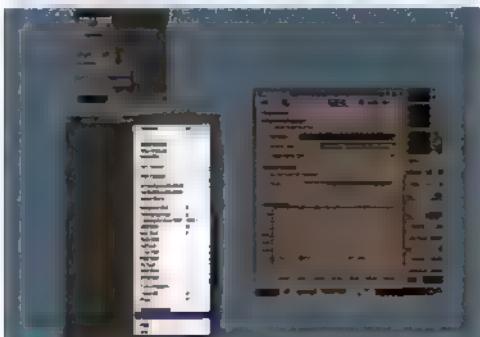


14 Be sure that the upper border of your selection aligns exactly with the lower border of the upper lid cluster; toggle between the view of your upper cluster and your selection to compare. Don't forget to include the polygons that wrap to the inside of the lid.

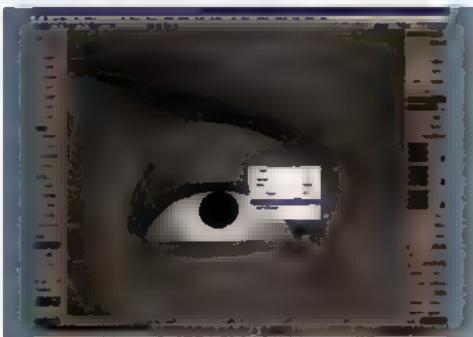


15 Store this cluster as 'eyelid_left_under'. Repeat steps 7 to 15 to create the right eyelid upper and lower clusters. Click on the cluster button with Buster's head selected; your cluster list should look like the one here.

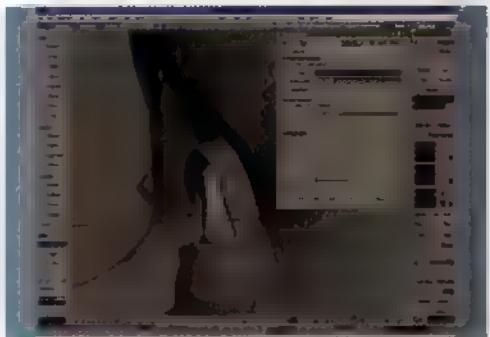
STAGE FOUR | Modelling the shapes



16 This stage requires some modelling skills, but we're focusing on rigging, so your shapes don't have to be perfect. Before starting, set the Construction mode to Shape Modeling. Unhide the eyes in the User viewport (Isolate All) and activate Proportional editing by clicking the Prop button. Right click the Prop button to open its properties. Set the distance limit to 0.05 and check Tagged Points Only.

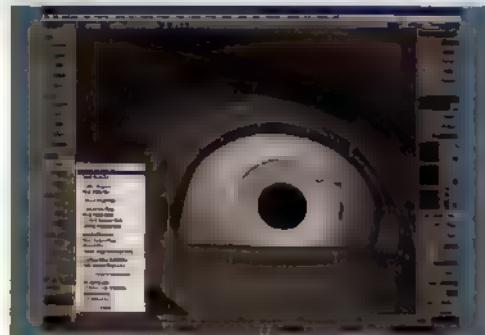


17 Select the eyelid_left_over cluster by selecting the head in the User viewport and clicking the Clusters button. In the pop-up menu, select eyelid_left_over. The points in the cluster will highlight white. [Alt]+right click over the highlighted cluster and choose Select Members/Components.

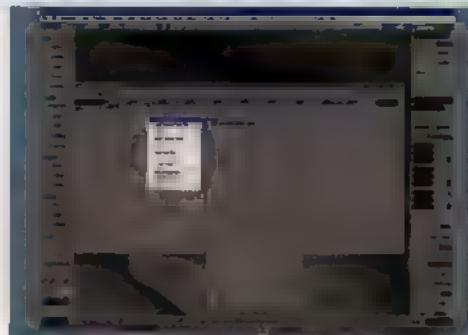


18 With the points selected, hold down the (M) key and reshape the lid to make an open shape by moving points around the inner edge. Refine the shape by orbiting around the eyelid area, and lower the proportional limit as you progress.

STAGE FOUR (Continued) | Modelling the shapes



19 Once you're satisfied with your eyelid shape, click the Clusters button again and select the eyelid_left_over cluster. In the Animate toolbar select (Deform > Shape > Store Shape Key). Name the shape eyelid_right_over_open.

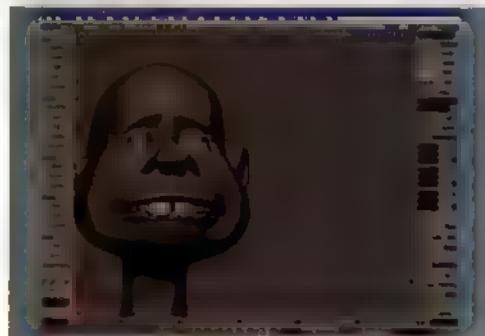


20 Open the Animation mixer for the head by typing [Alt]+[0] with HeadGeo selected. Add a Shape track ([Shift]+[S]). Right click anywhere on the Shape track to bring up the Contextual menu. Select Insert Source, and pick your newly created shape.

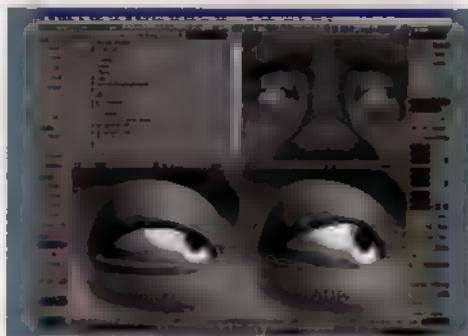


21 With the clip selected, right click and select Clip Properties. In the Time Control > General tab, set the Source Clipping In to 0 and Out to 500. Set the Time Reference Start Offset to 0. Set the Weight slider to 0 to return the lid to its original shape. Repeat steps 16-21 for the lower eyelid, and the right upper and lower eyelids.

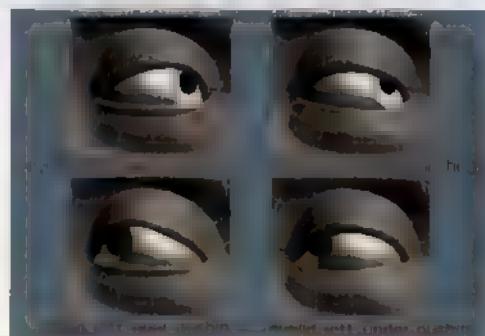
STAGE FIVE | Modelling the side-to-side shapes



22 When the human eye looks to the extreme left or right, the eyelid naturally deforms. We'll need to create these shapes as well, in the same way as we did in Stage Four, to achieve a realistic deformation with our rig. Begin by translating the lookat object to -1 in X, so Buster looks to his extreme left.

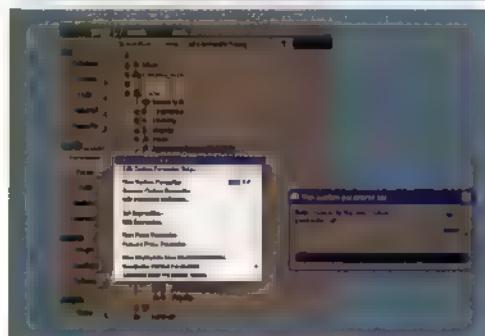


23 Refer to the image above to make your push-out shapes for the left upper and lower lids. They should lift and pull in the direction the eye is looking, so as to suggest the elliptical structure of the eyeball. Store the shapes and add them to the mixer, naming them as follows: 'eyelid_left_over_pushout' and 'eyelid_left_under_pushout'.

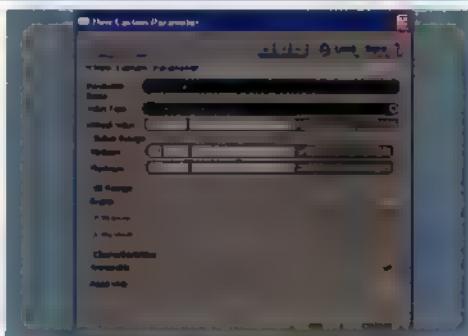


24 Change the lookat position to +1 in X, so Buster looks to his extreme right. Repeat the previous steps to create your push-in shapes for the left upper and lower lids. Store the shapes and add them to the mixer, naming them as follows: 'eyelid_left_over_pushin' and 'eyelid_left_under_pushin'.

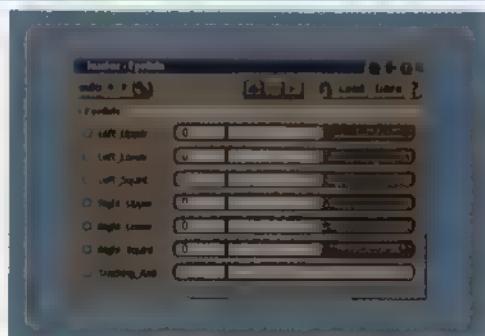
STAGE SIX | Creating the slider panel



25 There are many ways to interact with the controls in a character rig. We prefer to use sliders because they offer a fine level of control and conveniently group the controls inside a movable window. Select the Buster node, and in the Animate toolbar select Create > Parameter > New Custom Parameter Set. Name it Eyelids.

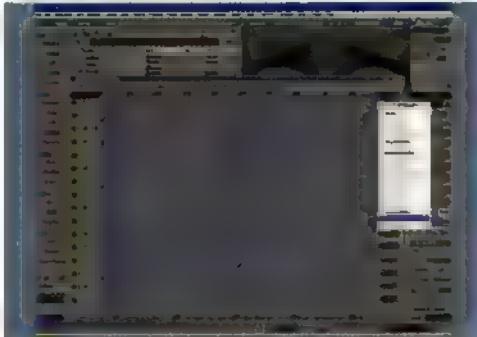


26 Open an Explorer window and select the Eyelids Parameter Set. Type [Shift]+[P] to add a new parameter to the set. Name this parameter Left_Upper, and set the Value Range Minimum to -1 and the Maximum to 1.

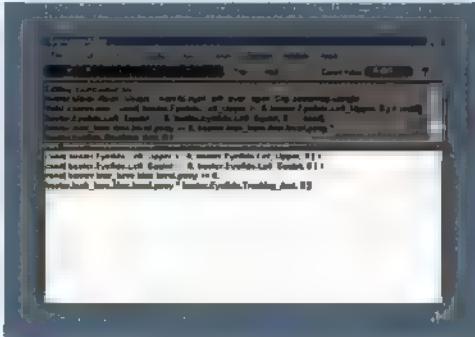


27 Create parameters for Left_Lower, Left_Squint, Right_Upper, Right_Lower and Right_Squint with the same Value Range settings. Create a final parameter called Tracking_Amt. Set its Value Range Minimum to 0 and the Maximum to 1. Click on the orange Eyelids Property icon to inspect the custom parameter set.

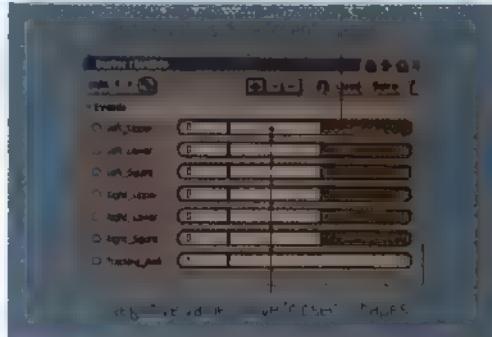
STAGE SEVEN | Wiring the system



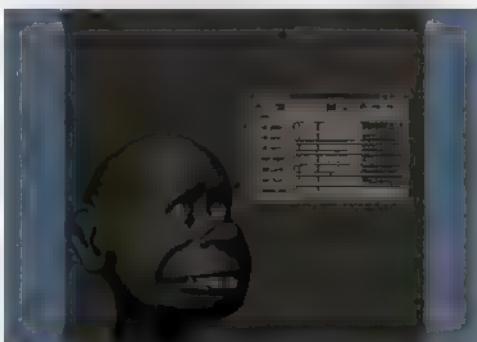
28 We'll now establish the connection between the lookat system, the Eyelids Custom Parameter Set and the eyelid shapes. We'll use expressions to combine the inputs. Open the Animation mixer for HeadGeo. Your track layout should match the above image. Right click the green Animation icon to the right of the eyelid_left_over_open clip. Select Expression Editor from the pop-up menu.



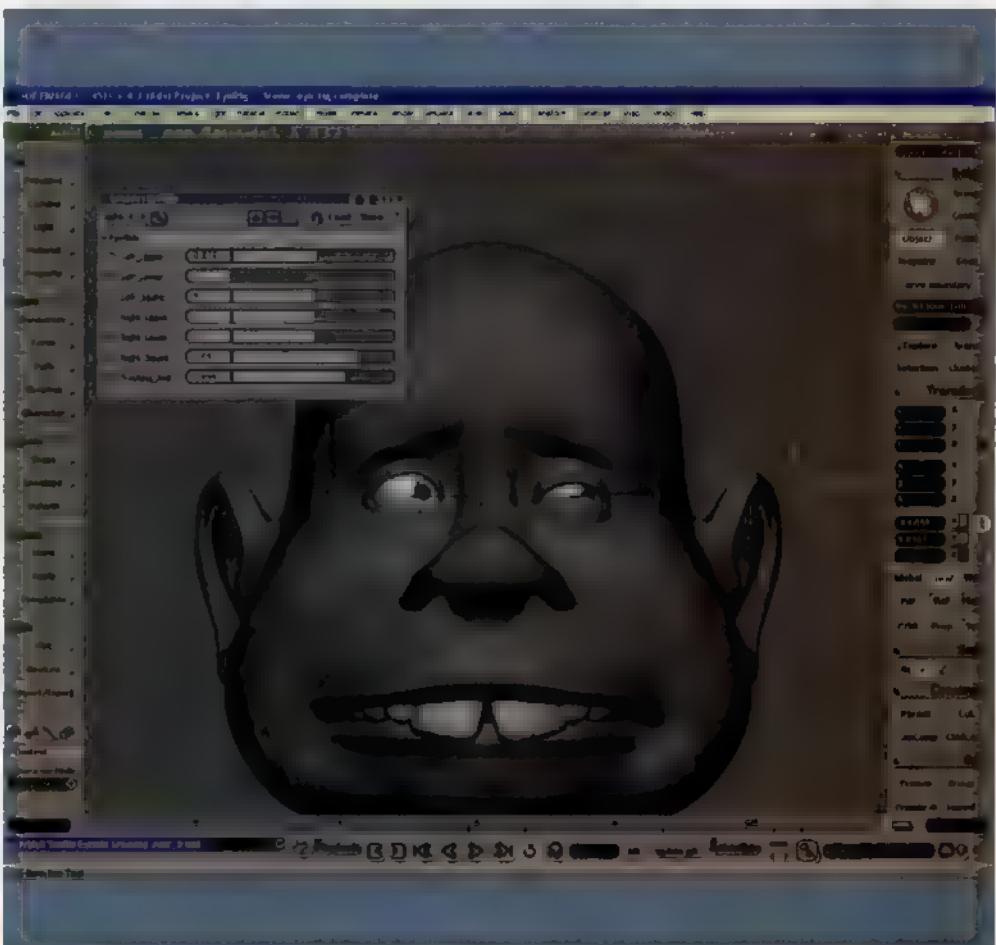
29 You'll see an empty white text field in the editor; this is where we'll write the expression to drive the weight of the eyelid_left_over_open clip. Copy the first expression from the Expressions.doc file found on the CD. Validate, Apply and close. Repeat these steps for each shape clip in the animation mixer using the pre-built expressions supplied in the same document.



30 Our slider panel has controls that generate negative as well as positive values, this is a convenient way of controlling two shapes with one slider. We want the left upper lid to open only when the Left_Upper slider is greater than 0, so we'll use the condition function to achieve this. If it isn't above 0, the expression returns a value of 0.



31 To determine the amount of automatic tracking for the Upper Open shape, we need to check the Y position of the lookat object. Only if the Y position is above 0 do we contribute its influence. This way, the open shape will only become active when the eye is looking up. The Tracking_Amt slider controls the amount of automatic influence, giving the animator more flexibility.



32 Finish by typing in the remaining expressions for each of the clips. After completing all the expressions for the twelve shape clips, our rig is complete. Close the Animation mixer, and frame all in the User Viewport. Select the lookat nulls and create a group ([Ctrl]+[G]). Name it 'hidden_controls' and hide the group ([H]).

33 Open the Eyelids Custom Parameter Set. Click on the Lock icon to keep it active. Set the Tracking_Amt slider to 0. Select and move Buster's lookat in a circular motion. His eyes follow, but there's no automatic eyelid deformation. Set the Tracking_Amt slider to 1. Now his automatic tracking is fully active, and will respond to the movement. Take some time to experiment with different

combinations of slider settings. The combination of these controls allows a broad range of expressions, from realistic to cartoony. You may notice that it's possible to overshoot and create some undesirable shapes but, with the great degree of expression and flexibility offered by this system, you'll find that with a little practice you'll be able to create convincing, naturalistic eyelid animation every time. ■



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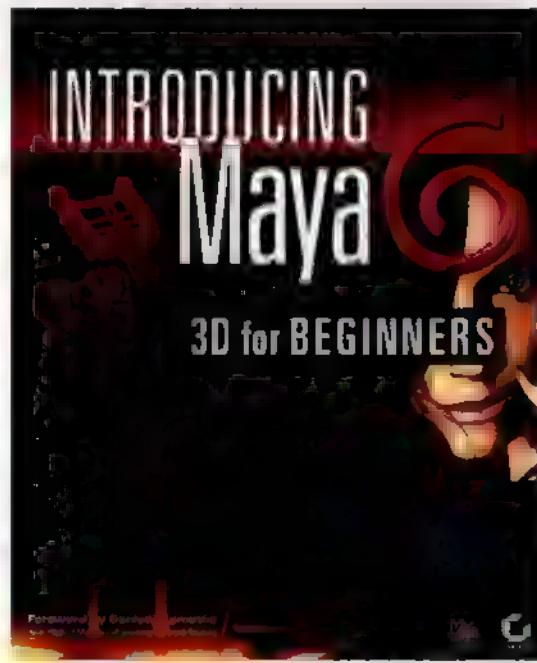
Which of the following films has Maya pro and Sybex author Dariush Derakhshani NOT worked on?

- A. Shrek 2
- B. X-Men
- C. Harry Potter and the Prisoner of Azkaban

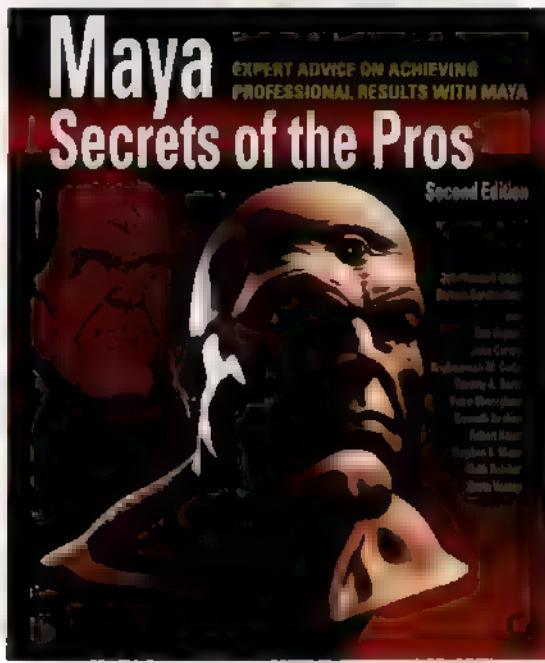
TIE-BREAKER

If I won a copy of one of the books, I would use it to... (complete in 20 words or fewer)

Email your entry to 3dw.competition@futurenet.co.uk, including the words 'Maya Book Competition' in the subject line. Include your full name and address, and indicate which book you'd like to receive. The 20 best entries received before 26 August 2005 will win the senders a copy of the book of their choice.



• *Introducing Maya 6: 3D for Beginners*, by Dariush Derakhshani, offers a fun and easy-to-follow guide to Maya, and to 3D in general



• *Maya Secrets of the Pros*, by Derakhshani and John Kundert-Gibbs, provides detailed instructions on every aspect of the program

ON THE CD

- *Mojoworld 2 SE* (worth \$149), plus full tutorial files

SEE PAGE 115

MOJOWORLD

Infinite worlds

Be your very own George Lucas and build as many weird and wonderful alien worlds as you can dream up, with *Mojoworld 2 SE*: the powerful full landscape-creation software on your CD BY CALYXA OMPHALOS

FACTFILE

FOR

Mojoworld 2 SE

DIFFICULTY

Elementary

TIME TAKEN

2 hours

ON THE CD

- Full-size screenshots
- Annotated to show important features
- Reference manual
- Help files
- Final scene file

ALSO REQUIRED

N/A



Mojoworld is more than just a landscape creator. Where other landscape-creation packages allow you to merely build a stage set, *Mojoworld* gives you planets the size of Earth. You can, therefore, point your camera in almost any direction without ever seeing hollow edges of terrain pieces. This full planet paradigm does require a bit of a change in your thinking; rather than building a specific scene, you've got a whole new world to explore.

Mojoworld 2 SE, included on this issue's CD, enables you to create new planets and significantly modify existing ones. It differs from *Mojoworld Generator 2* – the version of the software that most previous users will be familiar with – in several ways, most notably that it doesn't allow access to the Pro UI (the Function Graph Editor). However, unlike *Generator 2*, it does include the new jogNav Navigation tool. And while the Planet Wizard isn't available in 2SE, one new feature is the ability to import standard 3D model formats. It does include the *Mojoworld 2 Transporter* interface in its entirety.

When the application is launched, an introductory screen will give you the option of viewing a startup tutorial. This is a set of

HTML files viewed in a web browser. You should review these files to master the basics of navigating a *Mojoworld* planet, and for an introduction to the pieces of the Generator interface.

Once you've done so, you're ready to begin this tutorial, which covers the process of opening and modifying an existing planet, including creating the crescent moon effect seen above.

After you've explored *Mojoworld 2 SE*, you may want to upgrade to the latest version of the software. In *Mojoworld 3*, the tools for manipulating planets and imported models have been dramatically improved. Version 3 also adds several new object types, including pre-textured plant models, a PhotoBillboard object, a Boulder tool, and a large spotlight. To download *Mojoworld 3*, visit the Pandromeda website at www.pandromeda.com. 3D World readers can buy *Mojoworld 3* at a 20 per cent discount. See page 54 for details.

Calyxa Omphalos has been rendering computer-generated landscapes for a decade. She follows the True Path of Mojo and has a sadly outdated website. [\(w\)](http://calyxa.pandromeda.com)

STAGE ONE | Setting up custom rendering and textures



01 Click File > Open using the Browser to view the Planet library dialogue. With the scroll widget on the right, scroll down to the planet named 'spikes.mjw'. Double click the planet's icon to load it. If the library browser doesn't show the Planet library, click on the House icon in the upper right corner.



02 To get a feeling for the application, it's a good idea to explore the world, and find an interesting view. Use the JogNav flat arrows to move your camera forward, backward, left or right. Use the Trackball to look around while remaining in place. Drag on the arc above the Trackball to change the camera's Field of View.



03 Click the 'Render Now' Camera icon to render a Medium Quality version of the scene so far. The resulting render will be the same size as the Real-Time Render preview window (referred to as RTR for the remainder of this tutorial). The length of time this will take depends on the speed of your computer and the position and view of the camera.



04 We'll now define a custom render setting for quick preview renders. To the right of the Render Now Camera icon is the Render Settings Menu icon. Click this to open the Render Settings menu. Now choose the Settings item to open the dialogue box for defining a custom render setting.



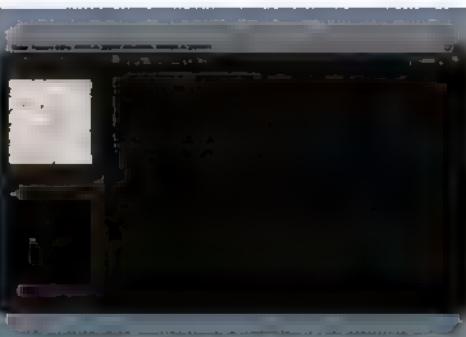
05 In the Settings Editor dialogue box, click the Menu icon in the upper left and select 'Add New Setting...' to create an editable render setting. The default name for the new setting will be 'New Setting'. Refer to the screenshot above (a full-size version can be found on the CD) to see which parameters to use.



06 Select your setting on the Render Settings menu. If the custom setting has a different aspect ratio from the RTR, a pair of dashed blue lines will indicate the edges of the area to be rendered. These will be across the top and bottom if the setting is wider than the RTR, or on the left and right if the setting is taller.



07 What makes Majoworld unique is Overhanging Terrain. This is created through the land material's Displacement parameter. The displacements don't show up in the RTR, so it helps to temporarily disable them. Open the Land Material Editor and select the material leaf to show its parameters. Click the circle-T attached to the displacement parameter to open the displacement texture.



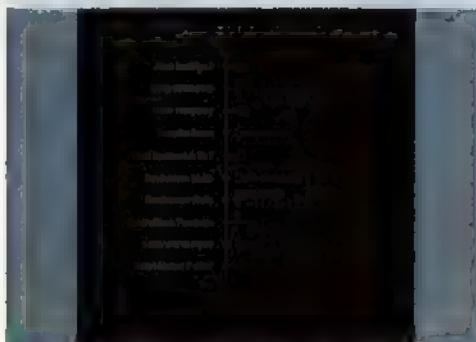
08 Each texture leaf is attached to the texture tree with a small circle. Clicking this circle disables the leaf. This particular texture has only one texture leaf. Temporarily disabling displacements can help determine if a render is hanging due to being inside a displacement or if the world in question is just very slow to render.



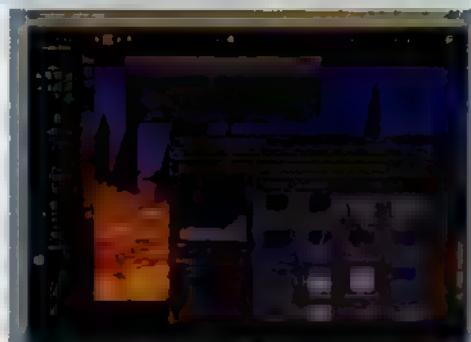
09 Do another test render preview without the displacements. The screenshot for this step shows two open Preview Render windows. The one in the lower right has displacements enabled and the one in the upper left has the displacements disabled. This world gets much of its character from the material displacements, so enable the texture leaf again before proceeding...



STAGE TWO | Creating the atmosphere and the crescent moon effect



10 Some of the next few parameters we'll be changing are more advanced, and are hidden so as not to overwhelm the novice user. Under the Editors menu, choose Preferences to open the Preferences Editor. The preference we'll change in here is the Generator UI Mode. The default is 'Simple,' so change it to 'Normal' and then click OK.



11 Now we'll load a new Atmosphere from the Skies library. Open the Sky Editor by clicking on the Sky Editor Global Parameters Hot button. Click the Menu icon and select Load From Library to open the Skies library. Use the scrollbar on the right to scroll down in the sky presets. Select LightYearSky.mjl and click OK.



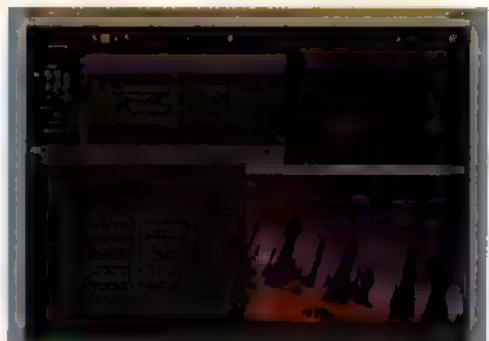
12 Expand the Atmosphere Control Stack and drag the lower right corner to view the Atmosphere parameters. The Color Perspective parameter has three fields specifying how much Red, Green and Blue light attenuates through the atmosphere. Values larger than 1.0 are significant, so the RGB values can't be represented by a simple Color dot. Again, refer to the screenshot for values.



13 Now we'll load in a moon, but before doing so, make sure that the Sun Orbit red line is visible in your scene. Click the Moon Global Parameters Hot button to open the Moon Editor. Click the Menu icon and choose Load Moon From Library to open the Moon Library Loader. Select K1Moon.mjl and click OK.



14 Click the clock dial to open the Time Editor. Drag the Rotation Position control until you see your Sun on its red orbit path appear at the top of the RTR. Always move this control immediately after importing a Moon, as this will cause the Moon to synchronise itself with Global Time and avoids a glitch where the Moon may unexpectedly jump on its orbit later.



15 Use the Orbit Position dial in the Moon Editor to position the Moon on the horizon. Leave a sizable gap between the positions of the Sun and Moon. Next, use the Time Editor Rotation Position dial to rotate both the Moon and the Sun back up to where the Moon crescent should appear, ensuring that the Sun is placed where it will illuminate just the crescent.



16 The Time Editor also has a control called 'Orbit Position'. This dial controls the inclinations of the Sun's (and any Moons') orbits, simulating seasons. Note that if the Sun and Moon orbital planes coincide, one or the other orbit might not be visible without tweaking the Time Editor's Orbit Position control.



17 Just like in reality, the relative positions of the Sun and the Moon determine how much of the Moon is illuminated. Using the three different Orbit Position controls found in the Time, Moon and Sun Editors, it's possible to create all the phases of the Moon. With the Sun and Moon on opposite sides of the Planet, for example, the Moon is full.



18 The Moon's orbital inclination may be affected with the Pick tool. The Pick tool must be active and the Global Parameters Hot buttons must be showing. The orbital inclination change may not be apparent until the Orbit Position is adjusted in the Time Editor. It won't work on the Sun until a Render object has been assigned to the Sun.



STEP THREE | Colouring and texturing the planet's surface



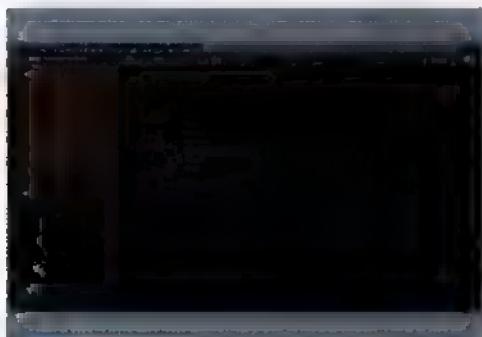
19 Now we'll change the colour of the surface. Click the bottom-most Global Parameters Hot button to open the Land Material Editor. Click the first material leaf to display its parameters. The Diffuse parameter is driven with a texture, so click the circle-T to open the Diffuse Texture Editor. In the Texture Editor, click the first circle-T to open its Kickstand, and then click on the Output Controls.



20 Click the Gradient Icon to open the Gradient Editor. Click in the Gradient to add a new Color knot, or click below a knot to select it. Click the Color Dot to open the Color Picker. Drag on a selected Color knot to move it. Use the Delete key on the keyboard to delete the selected color knot.



21 The Input Curve affects how the colours of the gradient are spread across the fractal, creating the texture. Refer to the screenshot for crop render samples showing the unmodified texture after adding the new colour to the gradient, and then after setting the Min Input parameter in the Input Curve to 1 (which allows the gradient to cover the full range of the fractal's output).



22 Now click the circle B that connects the two texture leaves to change the Blend between them. It's currently set to Altitude, so change it to Slope. This will put the colour texture defined by the first texture leaf on the steep portions of the world. The colour texture defined by the second texture leaf will appear on the flat portions of the world.



23 Much of the foreground is too dark, so we'll add a Point light. Select the Point Light tool, and then click in the RTR to place it. The Translate tool will now become active. Drag on the blue control handle to move the light up off the Planet's surface. Click the Light Hot button to open the Light Editor. Check the Falloff box, or the light will illuminate the Moon...

24 Render out your final image. All the renders done so far have been without shadows, which are turned off in the Low, Medium and Normal render settings, but turned on in High and Maximum. When a custom render setting is defined (see step 5), a checkbox allows you to specify whether or not to render with shadows. While they add realism, shadows can greatly increase the time it takes

to render an image, so use them carefully. That's the end of this introductory tutorial, but we've only just scratched the surface of what's possible with Mojoworld. To go further, experiment with the software for yourself. For example, try changing the Basis Function used in the Displacement Texture (see steps 7-9), add an Ocean, or load a different Land Material from the library. The possibilities are endless! ☀

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True blue

Even on low-budget shorts, bluescreen work is a vital part of the modern VFX artist's toolkit. Improve the quality of your bluescreen footage with these tips

From multi-million-dollar movies to student shorts, bluescreen work is now one of the most important tools in the visual effects artist's armoury. The technique allows a filmmaker to shoot foreground action against an evenly lit coloured background - usually blue or green - then replace these background areas with another image during compositing. While this second image can be a live-action plate, the technique is now commonly used to integrate actors and sets seamlessly into an all-CG environment. The technique was recently taken to its natural conclusion in movies such as *Sky Captain and the World of Tomorrow*, in which all the action was shot against coloured screens, which were then replaced with digital backgrounds.

But while all that is actually required for the technique is a length of blue fabric and a desktop compositing package (for details, see our 'Bluescreen on a budget' tutorial from Issue 60, or download it from our website, www.3dworldmag.com), to achieve truly polished results requires skill and experience.

So this month, we've asked three VFX artists to provide their tips for creating better blue and greenscreen effects. We'll start by answering one of the questions most commonly asked about this kind of work - what determines the choice of a blue or green screen in the first place, and can you use other coloured backgrounds? - before moving on to crucial considerations such as lighting setup, screen placement, and ways of avoiding pitfalls such as unwanted reflections and colour spill. On the way, we'll be revealing a number of tricks of the trade such as using reflective foil on the floor of a set or employing a waveform monitor to check the evenness of the lighting on the screen. Finally, we'll look at those situations in which it's best to avoid bluescreen work entirely and rotoscope footage by hand.

Spanning the entire course of a shoot, from creating the set to processing the resulting footage, these production-proven techniques should prove applicable for a wide range of projects, and for an equally wide range of budgets - from independent shorts to professional ad, film and promo work.

Our experts this issue:

Bruce Davies Bruce is a founder member of UK digital animation studio Chromakey, where he's Director of VFX and Head of Special Projects. He currently works on the BBC's <i>Doctor Who</i> .
Jonah Hart Jonah has worked on films like <i>Star Wars: Episode III - Revenge of the Sith</i> and <i>The Mummy Returns</i> , as well as the BBC documentary <i>Pyramids</i> and <i>Mayan Empire</i> .
Christopher Kenworthy Chris is a writer and director who has directed a number of TV ads and is producing the effects for http://www.humanity.org .



BLUE OR GREEN?

Why do we use both blue and green screens for visual effects work? Well, blue screen was first invented as an optical process. Greenscreen came later and it was used first for analogue TV and then for digital cameras. While it's possible to use any colour as a key, there are pros and cons involved in your choice. The separate layer of the film theoretically has the sharpest focus, but it also suffers from the odd色差 (chromatic aberration) which affects the midtones more in the foreground of the image. [BS]

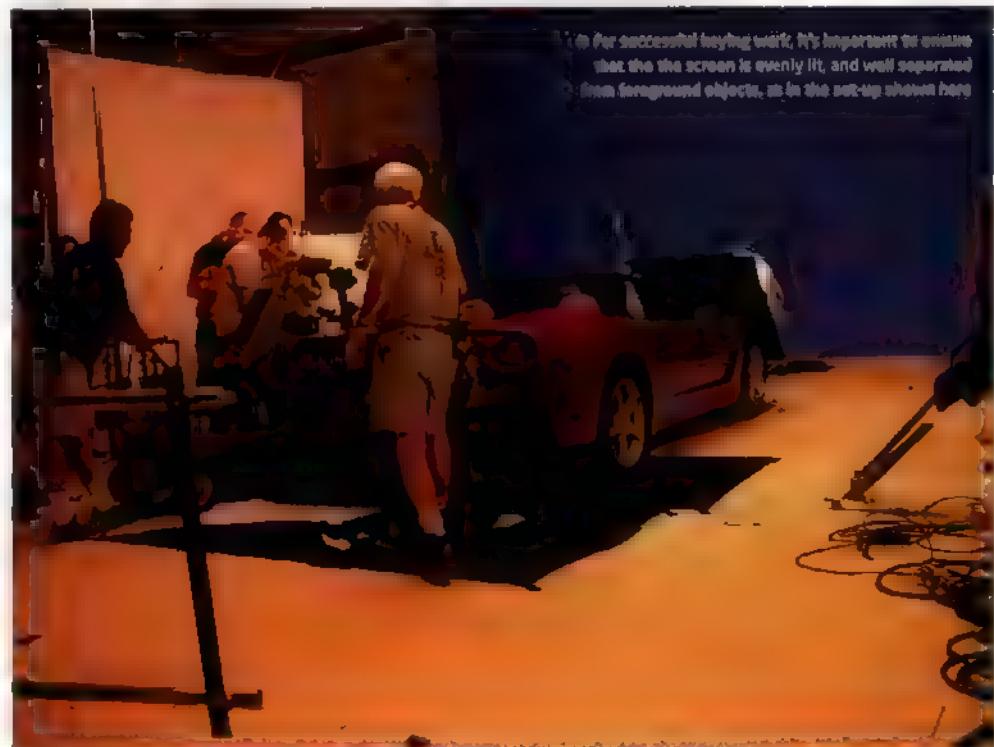
LIGHT THE FOREGROUND FIRST

Light the actor or foreground elements first then add extra lights to make the background as even as possible. Doing things the other way around tends to be a source of trouble as it creates shadow areas and will mean a lot of clean up work is required later on. Make sure that the lighting is subtle, as opposed similarly to that of the background. A simple test is to put a known element - keyboard by default - in the subject and then the background. [BS]



EXTREME ENVIRONMENTS

Environment you can control like an underwater shot may require a black screen; however this can result in complex backgrounds which makes it difficult to key the shot - either because the space is too big, the water has many particles suspended in it or simply because the actor has dark hair and won't cut. In situations like this it would be worth doing a test with a consumer camera before arranging the shoot. The only solution may be to recode the footage in a tank, rather than in open water. [BS]



FOR FLAMES, SMOKE AND WATER, YOU SHOULD ALWAYS SHOOT AGAINST A BLACK BACKGROUND

SHOOTING SKIN TONES

Both blue and green screens have advantages when it comes to shooting actors. Certain skin tones contain less blue, which reduces colour spill when using a blue screen, but the brightness of a green background sometimes means that this produces a better end result. If your actor is eventually going to be placed against a dark background, blue is usually the best choice. [BS]

TRY OTHER COLOURS

You don't even have to stick to blue or green screens for keying work - just try to choose a colour that's different from your foreground elements. If you have to shoot green and blue balls bouncing in bright light, for example, you might even choose a red screen! For flames, smoke and water, you should always shoot against a black. [BS]

ULTIMATTE RESULTS

If you have the budget, use an advanced compositing system like Ultimatte. This adds another dimension to arranging a shoot. You'll get even better results if you also use specially produced Ultimatte stocks and paint the background with Ultimatte blue or green. In addition, you

lighting set-up should reflect the compositing system you're using. For example, if you're taking advantage of *Ultimatte's* advanced spill removal capabilities, you should place more lights at the sides of the set to compensate for the way the edges of the actors will be darkened once you apply the removal process. Remember that *Ultimatte* works by colour modulation, while *Prismatte* is based on lumance [10].

MIRROR THE FLOOR

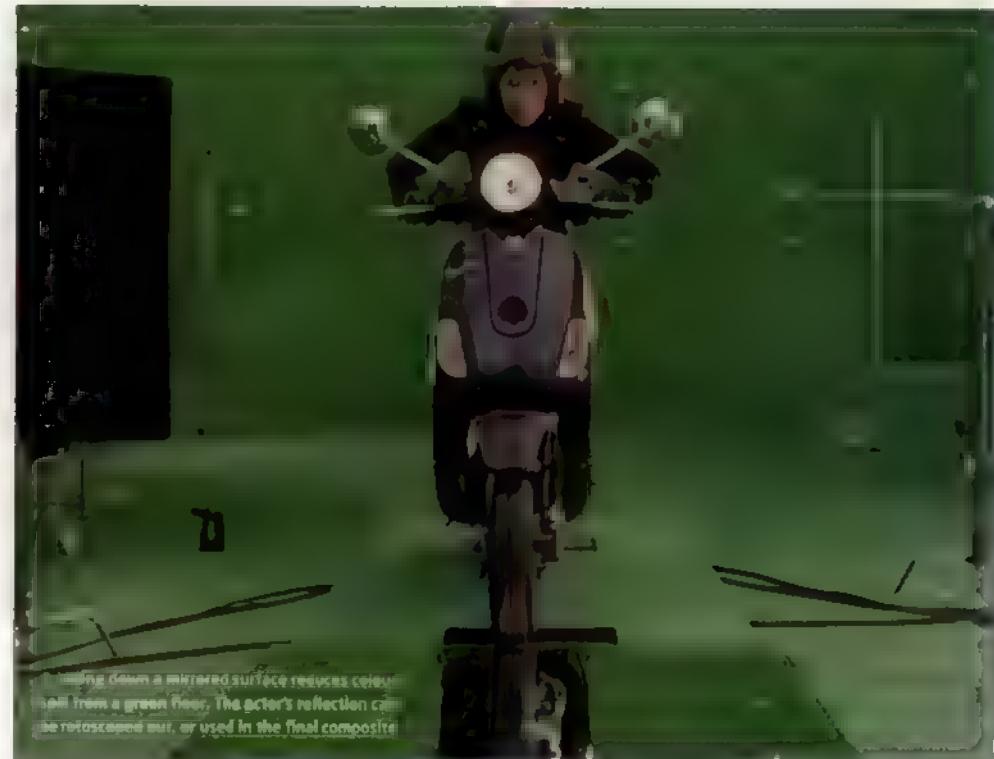
A neat trick to reduce spill from a green floor is to lay down a mirrored surface (like mirror plex or mylar) and have the actor walk on that. From most angles, the camera will see the reflection of the greenscreen behind the actor, but the actor won't be lit by green reflected light bouncing up from the floor. One possible drawback is that the actor's reflection will appear in the floor and so you'll need to rotoscope it out. However, this can sometimes actually be an advantage if the actor's to be placed on a polished floor or wet surface. Compositing the reflection with a 'Screen function, and maybe some distortion, can really lock the actor into the scene [11].

HIRE A DECENT CAMERA

Where possible, use 35mm film cameras (or the new HD digital cameras) for bluescreen work. 16mm shouldn't represent too much of a problem, but don't use domestic DV cameras, and never Hi8 or S-VHS. If you don't have a choice, at least use a proper DV camera that's able to record frame-based material, and when digitising, get the maximum quality you can. Your mattes will need a lot of work before they're of acceptable quality but at least it'll be possible to do serious work [12].

KEEP YOUR DISTANCE

Probably the best tip for bluescreen work is get as much separation between the screen and the foreground as possible; ideally, they should be at least four metres apart to minimise spill (blue or green light reflected from the screen onto the foreground). However, as the camera is moved further away both a larger screen and more lights are required, so the actual shooting distance is always a compromise. On location or on a cramped set, it may only be possible to get a metre or so away from the screen. In this



Even if the shot is for TV, it's sometimes best to get a full 10-bit log 2K scan and work from that. The extra resolution and deeper colour space will give you the best chance of pulling a matte [13].

WATCH OUT FOR REFLECTIONS OF THE SCREEN IN GLOSSY SURFACES AS THESE CAN CREATE BIG HOLES IN YOUR MATTE

case, try to choose your foreground objects to minimise the effect: a dull black suit will show much less spill than a white silk dress. Using some brights of the opposite colour (pale yellow for bluescreen work, pale magenta for greenscreen), can sometimes solve the problem [14].

USE A WAVEFORM MONITOR

If a shot is particularly important, you should get a Waveform Monitor (like the one in *Final Cut Pro*) onto the set and feed the video assist into it. This makes it very easy to detect any defects in the set-up such as colour deviations (inconsistent colour), variations in luminance levels or non-homogenous lighting [15].

USE A SEPARATE BEAUTY PASS

Where possible, ask for the electronic colourist to provide a technical grade and matching beauty pass. The first to pull the matte and the second to use as a fill. It can hold a much wider range of colours than digital tape formats, so the colourist can select a colour correction to increase the separation, making it easy to pull a really clear key. Similarly, the beauty pass can be corrected for spill or even leave colour corrected, without fear of compromising the key pass.



Although unavoidable in some shots, slight variations in the lighting of the screen will create problems later on. Viewing the set through a brown gel can help you to spot inconsistencies

FOCUS ON THE INVISIBLE

When actors are shot in front of a bluescreen, you frequently want them to look at something that's not there. If they get this wrong, your 3D work will be wasted because the shot will seem fake to the audience. If you want your actor to focus on something close to them, you can hang a tiny thread just in front of them. This makes them focus on the empty space, positioning their eyes accordingly. It's a subtle difference, but it instantly creates realism. Make sure the thread doesn't pass in front of the actor's skin as seen from your camera or it'll show up [16].

USE FEWER, SMALLER SCREENS

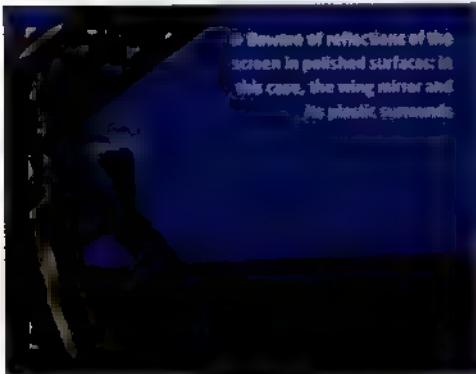
Avoid covering the whole frame in coloured screens if at all possible. If you can cover the action with a few well-placed small screens, it will cause a lot less problems for lighting and spill, making the shot much more believable [17].

DIFFERENCE MATTES

A useful quick tip is to shoot the bluescreen on its own as an additional piece of reference footage. That way you can help the chroma engine (if it's advanced enough, or you can do it by hand if not) to differentiate between the foreground and the background [18].

KEEP THE LIGHTING EVEN

One of the most important things when shooting a blue or green screen is to make sure that it's evenly lit. This can be difficult to judge once the lights have been turned on. You



can see much better by looking through a piece of lighting gel (brown for bluescreen and magenta for greenscreen) or at a push, dark sunglasses). By choosing a piece of gel of the opposite colour, you should be able to see all the dark and bright spots easily, and this will enable you to adjust the lights to compensate. [BS]

MOTIVATING A SCENE

Nothing sells a shot like a good performance, so give your actor as much material to work with as possible. Actors use their imagination at the time, but many are overwhelmed by the depth of imagination required on a bluescreen set. If your 3D artists have created roughs of the background landscape or the robot, monster or animal your actor is meant to be looking at, let your actor see them. [CK]

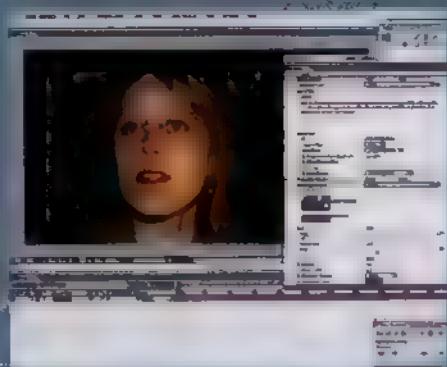
WATCH FOR REFLECTIONS

Watch out for reflections of the screen in glossy surfaces. These can be a nightmare, creating big holes in your matte. White objects like chrome traps or silver space suits are obvious danger areas, even more subtly reflective objects such as polished wood, shoes or spectacles – can cause problems. Dulling down surfaces with anti-reflective spray can help, as can adding extra light to the problem area. It may also be possible to place a small black or white flag on

the edge of foreground objects to be coloured with bluescreen paint...



AFTER EFFECTS | Using the Magic Bullet Suite plug-ins



01 Smoothing the rough edges

Magic Bullet Suite 2 (from Red Giant Software) adds a film-like motion blur to your footage. Normally, blur is a problem for chromakey because it can make the matte difficult to define. Magic Bullet's motion blur is subtle, and pixelated edges are made smooth. If you zoom in on the actor's edge, you'll see that whether or not there's spill, the border between actor and bluescreen is pixelated. Magic Bullet takes this away, so you can pull an incredibly clean matte. This will mean the Magic Bullet effect has to be used on your entire piece for the effect shot to blend in, but that's no bad thing – the results are excellent with HD, and make pulling a DV matte more than possible. [CK]

02 Rescuing a lost shot

Despite your best efforts, you can sometimes capture a shot that's extremely difficult to work with. Even when you've removed every visible shadow, there can still be problems due to the way your actor's clothes or face appear against the bluescreen. If an unforeseen problem such as this arises, there's a solution other than rotoscoping. Apply a post filter that adds a degree of misting, such as **Magic Bullet Suite's Look Suite filter**. Render times aren't overly fast and you'll need to add the look to your entire sequence, but this can save a difficult shot. Be certain to add the glow to foreground and background, and be wary of making everything so soft that it becomes blurry. [CK]

set to block coloured reflections while still leaving a keyable background. However, the best way to deal with reflective surfaces is to avoid shooting them in the first place. [BS]

GELS, FILTERS AND APERTURES

When setting up the shoot, don't use blue gels to force the background to be blue. This will also affect the floor, which will create problems such as brownish tinting in the final

composite. Similarly, don't use diffusion filters because this will affect the colour temperature of the lights. You may want to use polarising filters to eliminate glare so that the mattes stay crisp, but don't use fog or diffusion filters because these reduce the contrast of the foreground. Finally, don't shoot with the lens fully open since this will produce shadowing on the corners and is likely to create problems in a complex composite. [JB]

EXPECT THE UNEXPECTED

In the end there will always be some shots where you just have to knuckle down and rotoscope every frame by hand. Sometimes this will be because of lighting or exposure problems, but more commonly it's because something in the foreground unexpectedly shows up the same colour as the background. Common examples include the pale blue shirt that turns out to be a perfect digi-lal blue when in shadow or reflections of the screen in the model's perfect white teeth. This will make them vanish from the final shot, which is never a good look. [BS]

DON'T FORGET TO ROTOSCOPE!

Sometimes the smart decision is not to use a coloured screen at all and to rotoscope each frame by hand. That way the lighting isn't compromised and the shot will look much more natural. It takes some skill and patience on the part of the rotoscopist but it's often the route that's chosen by the top effects houses simply because it looks best. As a rule of thumb, if a shot is under 50 frames in length, it's usually easier to rotoscope it than to use a coloured screen. [BS]



Issue 64
Understanding fundamental animation principles, and setting up a basic bounce cycle

Issue 65
Using timing and deformations to inject personality into the hopper's movement

**FUTURE ISSUES**

Issue 67
Making use of the control rig from issue 66 to change the personality of the character
Subscribe today: page 40

SOFTIMAGE|XSI

Get started in animation Part 3

In the previous parts of our series of beginners' animation tutorials, we injected some personality into our hopper character. This issue, we show you how to give him a simple control rig

BY OLA MADSEN

FACTFILE**FOR**

3D artists

DIFFICULTY

Beginner

TIME TAKEN

hours

ON THE CD

- 3D Animation XSI
- Super Hopper
- Full Zeta screenshots
- Final animation

ALSO REQUIRED

3DWorld Mod Tool (a free learning version of this can be found at www.3dworldmag.com)



Rigging A word that many 3D artists associate with hours of frustration, grey hair and too much caffeine. But while sensitive souls may shiver at the mere thought, the difficulty of rigging – the process of creating a set of controls that modify a character's pose, rather than having to move every point on the model by hand – is often exaggerated.

Just as eating spinach is important if you want to grow strong, rigging is a crucial part in successful animation. While you wouldn't go as far as calling it the spinach of 3D, you could think of it as adding essential vitamins to your diet. Although it adds complexity to your animation, there's only so much you can achieve without it.

This tutorial marks the mid-point of the 'Get Started' series. Equipped with the fundamental principles, you should now be all set to bring the animation of your hopper to the next level. Last issue we introduced a bit of personality into the character's movement by taking use of the Quick Stretch deformer. This approach based the hopper's character on his actual motion. In reality, however, it's usually the other way around. Imagine two people jumping up and

down – where one is overweight and the other a tad slender. Although they're performing the same action, the way in which they do so will be quite different, due to their different physiques.

In other words, solely animating the hopper's position and overall scaling won't be sufficient for us to successfully create the illusion that he is really alive. In order to do this, we'll need a solution that enables us to strike any given pose we see fit, but at the same time is intuitive and easy to use. To do this we'll create a simple rig that enables us to control the pose of the hopper more precisely.

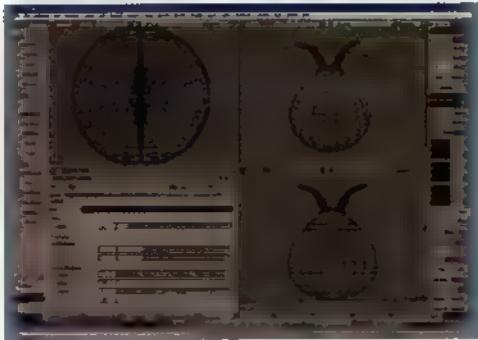
All the files needed to complete this part can be found on the CD. The tutorial uses Softimage|XSI, but if you don't own a copy, you can download the free educational version (the Softimage|XSI Mod Tool) at www.softimage.com/products/Mod. The two previous parts can be downloaded from our site: www.3dworldmag.com.

When not bouncing around the Swedish studio on his hopper, Ola thinks up weird and wonderful spinach analogies and animates everything from medical treatments to teddy bears [w] www.digitalcontext.se

STAGE ONE | Creating the control cage



01 Start by opening hopper scn from the CD. While we could animate the shape of the hopper's geometry directly, the mesh holds too many points to actually do so efficiently and maintain the overall control of the output. The idea is to set up and animate another object at a much lower resolution, and use its deformations to control the hopper's shape.

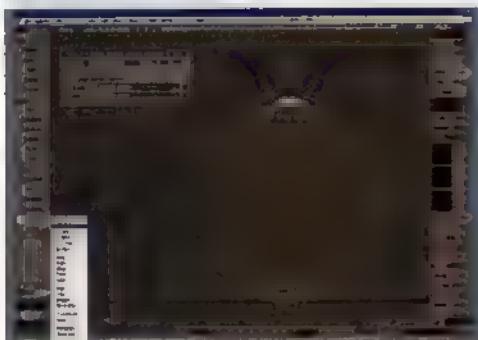


02 While this could be any object, the closer it is to the hopper's overall shape, the easier it'll be to predict how the final deformation will turn out. From Get > Primitive > Polygon Mesh, choose Sphere. In the Sphere Property editor, set the radius to about 4.2 and decrease the U and V subdivisions to 6. Next, move it about 4 units upwards so it aligns with the hopper.

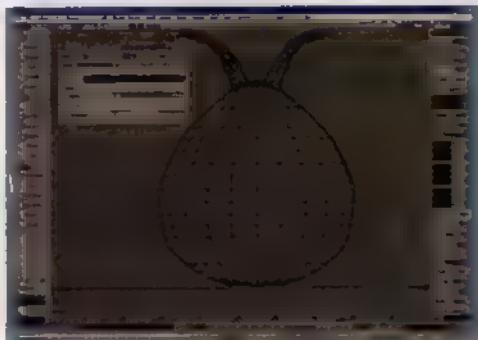


03 Now we should make the edges (or points) on our new object match up better. Press [T] to switch to Point Selection mode. In the Front or Right viewport, select each horizontal row of points, and move them either up or down so they align with the edges on the hopper geometry. Select each row and scale them so they exceed the hopper geometry (refer to the hi-res screenshot on the CD).

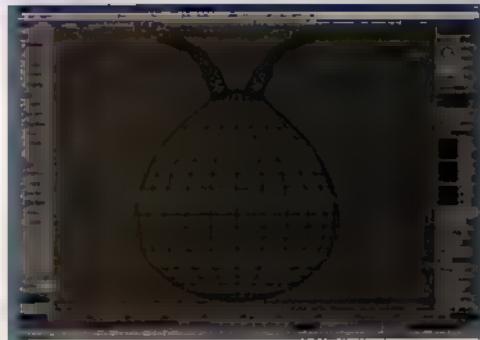
STAGE TWO | Controlling the cage



04 With the control cage complete, we'll need to attach it to the geometry of the hopper. Select the hopper, press [T] to enable point selection, and select all the points except those on the 'ears' (we'll control these separately). From Model > Modify > Deform, click By Cage and pick the Sphere. In the Property page, change the falloff to about 3.5 to get a smoother falloff on the deformation.



05 Due XSI's handling of geometry animations, we'll approach this differently to animating the Sphere's points directly. Click Model > Get > Primitive > Curve, click Circle and set the radius to 1. Rotate it 90 degrees along the X-axis and align it with the very bottom point on the Sphere. Press [CTRL]+[D] to duplicate and align it with the row of points above on the Sphere. Change the radius to 3.



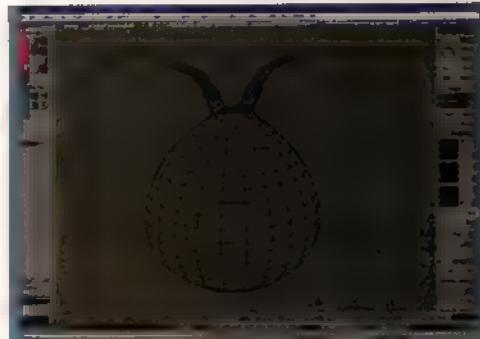
06 Press [CTRL]+[D], set the radius to 4.2 and align the new curve with the next row of points. Make another duplicate, move it up to the next row and set radius to 4.5. Create another duplicate, set radius to 4 and align it to the next row. Duplicate again, set radius to 2 and align with the next row. You should now have six circles. Select them and, from the MCP, click Transform > Freeze Rotation.



07 Select the Sphere and press [T] for Point Selection mode. Select the point at the bottom and, from Model > Modify > Deform click Cluster Center. Pick the corresponding circle (radius 1). On the Sphere, select the point rows just above, click the Cluster Center and pick the corresponding circle (radius 2). Repeat for the next three rows. Now, select the last row but select the top point too.



08 Click the Cluster Center again, and pick the corresponding circle (radius 3). Try moving each circle to ensure all the previous steps were completed successfully. As we now control the shape of the Sphere by the use of our circles, we no longer need it to be visible, cluttering our viewports. So, select the Sphere and press [H] to hide it.



09 While the Sphere is hidden, it can still be a bit difficult to distinguish the different circles. Click on the Palette icon (or [CTRL]+[4]) in the lower left corner to switch to the Palette toolbar. Click one of the colour palettes (preferably not pink or black, given the scene's colour scheme) and select each of the circles. Click the Toolbar icon to return to the Model toolbar.



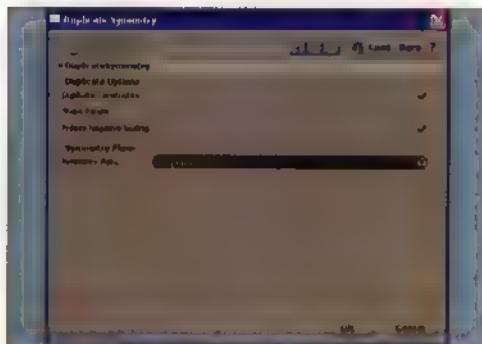
STAGE THREE | Controlling the ears



10 The design of the ears' requires a different approach from the body if they're to be controlled and animated efficiently. For this scenario we'll use five 'bones' (control rods) for each ear. Because the ears are excluded from the effect of our cage object, they won't be affected by any movement you make to the cage. To make sure they stay in their proper place, we'll need to parent them to the appropriate part of the cage.

11 Maximise the Right viewport. Zoom in on the ears and press the [2] key on your keyboard to switch to the Animate toolbar. From the Animate > Create > Skeleton click 2D Chain. Click slightly below the area where the right ear (which is the one you'll see on the left in the viewport) starts, to set the initial position for our chain. Next, click slightly above the area where the ear begins to create the first bone.

12 Click at the centre of the first (lowest) bulge of the ear to create the second bone; click at the next bulge to create the third; click the third bulge for the fourth, and finally click at the very end of the ear to create the fifth bone. Click on the right mouse button to end the chain. Please refer to the high-resolution version of the screenshot above on the CD to see the placement of each bone.



13 Instead of going through the process of creating the bones again, we'll simply copy them to create the chain for the left ear. Select the chain root (displayed as a green cross) with the middle mouse button to branch-select it. From the Animate > Create > Skeleton, click Duplicate Symmetry. In the Duplicate Symmetry dialogue box, change the Symmetry Plane to XY Plane and press OK.



14 Select the hopper, press [T] and select all the points for both ears. From the Animate > Deform > Envelope, click Set Envelope. If asked about Envelope Construction Mode, click 'Yes'. Now, pick each bone on both chains (ten in total). Click on the right mouse button to end the picking. From the Animate > Deform > Envelope, click Smooth Envelope Weights. Set the Neighborhood depth to 3 to smooth the weight.

15 Activate the Constraint Compensation button (cnstComp) and select both chain roots. Click Constrain > Pose from the Main Command panel and select the top circle. In the Pose Constraint PPG, switch to the Options tab and uncheck the Scaling checkbox to deactivate it. Next, create a null from the Get > Primitive menu and move it up 3 units. Activate the child transform compensation button (ChildComp), select all six circles, the hopper and the hidden sphere and click the Parent button. Now, with the middle mouse button, select the null to make it the parent of all the objects. By arranging your objects in 'parent-child' hierarchies, as well as setting constraints, you'll not only get a more organised scene but your overall control of the characters will also be greatly enhanced. The control rig is now complete, and in the next issue we'll be using it to create an animation.



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LEGO WARS

Hailed as more than just Star Wars in plastic brick form, LEGO Star Wars: The Video Game had to add a spark to the market. For the makers, the main focus was in creating a game people actually wanted to play - and the logistics of how the characters would hold their lightsabers, of course

BY JON JORDAN



One of the challenges for the game makers was in transforming the stiff yellow plastic LEGO figures into convincing digital forms, while also staying true to the look of the film's characters

You'd think it would be a straightforward task: two of the strongest global entertainment brands combined into a single computer game. Surely you could even title it 'LEGO Star Wars: The Hit Video Game'. If only... As demonstrated by the pitiful legacy of games based on previous licences, gamers have become harder to please recently. Of the dozens of Star Wars games, only a handful have enjoyed both critical and commercial success, and in the case of the more children-oriented LEGO games, the situation has been worse still. In a strange way, this proved to be the genesis of the LEGO Star Wars story.

Two years ago (in a galaxy not so very far, far away - Beaconsfield, England, in fact), a rebellion was being planned. Chief members of the alliance were Tom Stone and Jonathan Smith, then respectively MD and Executive Producer of LEGO Interactive. It had been releasing licensed products such as LEGO Racers, LEGO Football Mania and LEGO Bioware for years, but Stone and Smith decided that enough was enough. They proposed an ambitious, and risky-sounding future: leave, buy the rights to make LEGO computer games themselves, and talk to Lucasfilm about making a LEGO-based Star Wars game (LEGO Star Wars being the toy seller's most successful range).

"I EXPERIMENTED QUITE A LOT WITH THE LEGO CHARACTERS' LIMBS... WE THOUGHT IT WOULD BE FUNNY TO HAVE A PARADE OF STORMTROOPERS WOBBLING AROUND WITH STIFF LEGS."

JEREMY PARDON, LEAD ANIMATOR

Even considering Stone's previous employment as the Head of European Studios for giant game publisher Electronic Arts, it was a mark of their discerning business skills, enthusiasm and persuasive powers that both license holders agreed, albeit with the proviso (in the case of Lucasfilm) that their first game would support the theatrical release of Star Wars Episode III - Revenge of the Sith. Now all the newly-established Giant Interactive Entertainment had to do was make the game, which reprises the characters, plots and environments of Episodes I, II and III in LEGO form, and complete and release it by April 2005.

Despite never having worked with the developer, Smith says the first choice was always Cheshire-based Traveller's Tales. "We've known its games going back more than 15 years," he says. "There's barely any other company with that track record, not to mention reputation for robust technology and focused delivery."

TRAVEL GAMES

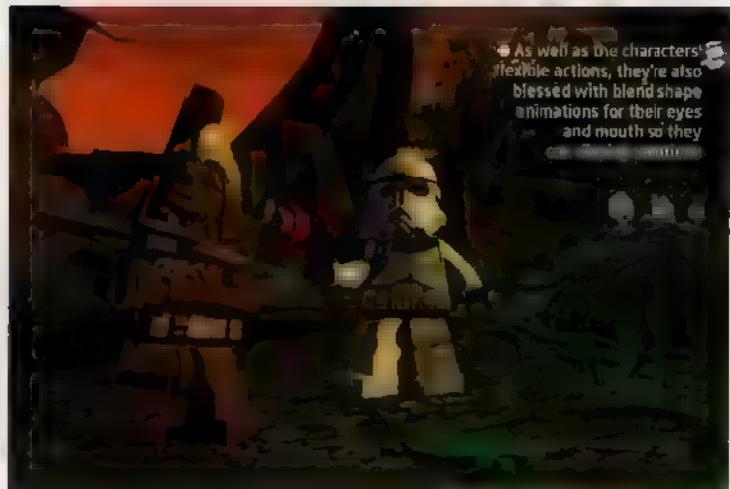
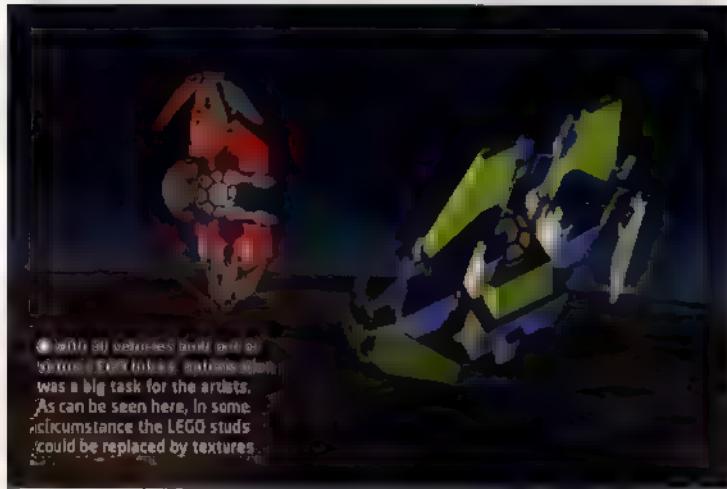
A low-key outfit, Traveller's Tales has nevertheless created games based on big-name brands ranging from film properties such as Disney/Pixar's Toy Story and Finding Nemo, as well as interactive characters such as Vivendi Universal's Crash Bandicoot and Sega's Sonic the Hedgehog. "I remember our first meeting with Tom and Jonathan," says Lead Artist James Cunliffe who, like many of Traveller's Tales' senior staff, has worked at the company since the mid '90s. "They had bought along the LEGO Star Wars kits and got us playing with them while we were having the meeting. I thought 'This bodes well!'" [As 3D World went to press, Traveller's Tales had just announced its merger with Giant Interactive Entertainment.]

So the game was underway. But, as could have been expected, it took longer to get the foundations right. "Our initial ideas



With characters like Jango Fett, who has a jet pack and dual pistols, there was more scope for actions like spinning pistols, cowboy-style

FACTFILE	
PROJECT	LEGO Star Wars: The Video Game
FORMATS	PlayStation 2, Xbox, PC
DEVELOPER	Giant Interactive
PUBLISHER	Electronic Arts
WEBSITE	www.electronicarts.com/travellers-tales
DURATION OF PROJECT	18 months
DEVELOPMENT TEAM SIZE	• 100 plus staff • 20+ artists • 20+ programmers
ESTIMATED BUDGET	£30 million
SOFTWARE USED	Maya, 3ds Max, Inhouse 3D, Photoshop, Final Cut Pro



were specific but also abstract," says Smith, in an appropriately confusing manner. "We had a straightforward framework and some game features in mind, but it didn't amount to a game, or any communicable vision."

That was down to the team at Traveller's Tales. "Typically, we'd start with a lot of paper design before we start work," says Cunliffe. "Companies such as Disney are more picky about what their characters look like than the level design."

Giant, and (by association) Lucasfilm and LEGO, were playing a different game though, and required paper based designs. "They were really keen on their pieces of paper," says Cunliffe. "We worked on a gate system where gate one is getting the document fat or right and gate two is a playable level. It took us about five months to get from gate one to gate two."

ANIMATING LEGO MEN

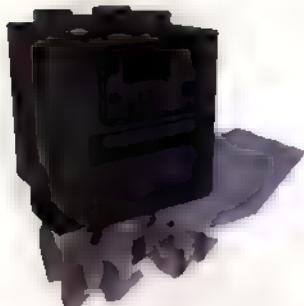
Part of the problem was transforming the stiff yellow plastic figures into a convincing digital form. I started off with test animations experimenting with having two bones for the LEGO character's leg, or using a rubber hose type approach where the whole leg would bend," says lead animator Jeremy Pardon. Another approach featured rigid limbs. "We thought it would be funny to have a parade

of Stormtroopers wobbling around with stiff legs," Pardon recalls. It wasn't what Giant had in mind however. "We wanted the characters to look and act like cool videogame characters and not be restricted by the influence of plastic. These had to be LEGO Star Wars characters of your imagination, not of the playroom floor," says Smith.

So it was back to the drawing board that was Maya. What Pardon ended up with was a skeleton consisting of 24 bones. "The legs are quite rigid, but I placed a subdivision in the middle," he says. "When I bend, it creates this knee shape which looks more natural and real than the other solutions we tried."

The leg has a head-based locator which helps overcome the Gimbal Lock inherent in some of the wilder attack animations, of which each playable character has at least seven, as well as enabling characters to be scaled. "Most characters are the same height but we had to change some," Pardon explains. "[General] Grievous, for example, just wasn't scary enough when he was the same height as the other figures. He also has thin limbs, which make him look even smaller. We scaled him up to one and a quarter scale."

A more serious problem was posed by the LEGO characters' short arms. "They're so short, getting their hands together to hold a lightsaber is impossible," Pardon laughs. His solution proved to be another vindication of Giant's decision to use Traveller's Tales' "I used a trick I learned working on the Toy Story 2 game," he says. "Back then I was trying to get Buzz Lightyear to push hisaser button but couldn't get his arm right. I studied the limb and discovered they'd cheated and extended it. I thought, 'Well, if they'



"These had to be the LEGO Star Wars characters of your imagination, not of the playroom floor," says the game's Executive Producer, Jonathan Smith.



Jango Fett's Slave 1 was made of curved bricks, which enabled the gamemakers to bend the rules when it came to creating other ships.

TRICKS WITH BRICKS | How models were optimised in virtual LEGO to run in real-time

For the artists at Traveller's Tales, working within an existing license such as LEGO Star Wars made life easier: "There were only six characters in the game that weren't already LEGO characters so most of them came effectively pre-approved," says Lead Artist James Cunliffe. The same was true for the game's vehicles.

With this in mind, the artists attempted to build the vehicle models in virtual LEGO bricks, using only shapes available in commercial LEGO packs. "Originally, our idea was to make sure people would be able to build our models in real bricks, but we found we did have to cut some corners," explains Cunliffe. Particularly problematic were the smooth curves of the Naboo Royal Starship. "It wasn't too bad because we could use many of the curved bricks from Jango Fett's ship, Slave 1, but there were some shapes we had to cheat," he says. "We've tried to keep it relatively subtle although I'm sure some aficionados will spot them."

A more serious problem was getting the Maya LEGO models down to a sufficiently low polygon count so they would run in a real-time game engine. This was partly due to a workflow in which the models were built using virtual LEGO bricks, just as they would if they had been using physical bricks. "We built the models by creating all the LEGO bricks in the Star Wars range and then literally following the instructions," Cunliffe reveals. "It's surprising how quick you get at creating models. It's certainly quicker than real-life because you're not messing around looking for bricks; you can duplicate ten more blocks if you need them."

Once created, however, it took twice as long to optimise the finished models down to size, particularly the LEGO studs. "The first thing I had to do was go through each model by hand and remove any polygons and edges that would never be seen by game players," Cunliffe says. "Then it would be a process of deciding how many

LEGO studs we could replace with LEGO textures. It's important because each stud is 11 polygons even on medium-sized models, this would really destroy your framerate."

Conversely though, in some circumstances the stud textures became apparent, falling apart if the angle of the in-game camera became too shallow. The result was lots of careful tweaking as well as judicious use of level-of-detail models, which is when several versions of a model of differing resolutions are used dynamically, depending on how close a character or object is to the camera.

But despite such measures, some LEGO vehicles remained too big for the current generation of PlayStation 2 hardware: "The six-legged All Terrain Tactical Enforcer (AT-TE) walker didn't fit so we had to make a two-thirds scale version," says Cunliffe. "It took ages because we had to adapt the instructions and still try to make sure everything fitted together and worked properly."

One of the charms of LEGO Star Wars: The Video Game is that evil characters such as Darth Maul manage to retain some menace despite their diminutive size

can do to you!" The result is that Jedi characters in the game have an extra joint in their forearm. Typically, for human characters this would be used to touch the wrist, but as this wasn't necessary, thanks to the inverse wrist joints of LEGO characters, but it did allow arm gestures to extend further. "It gives a cleaner shape and when a character is moving you don't notice the arms are longer," he says.

This is just one example of the attention to detail that's been applied to the game. Developed by what would be considered by industry standards a tiny team of coders and artists, Traveller's Tales spent a total of a week – especially for Pardon, who animated all of the game's 75 characters – to complete

"I REMEMBER OUR FIRST MEETING WITH TOM AND JONATHAN... THEY BROUGHT ALONG THE LEGO STAR WARS KITS AND GOT US PLAYING WITH THEM WHILE WE WERE HAVING THE MEETING. I THOUGHT, 'THIS BODES WELL!' " JAMES CUNLIFFE, LEAD ARTIST

the 45 unique animations required for each playable character in the game. "The Jedi were the most difficult characters to do," he says. "There's not much potential variation on them whereas with characters such as Jango Fett who has a jet pack and dual pistols there was more scope for fun things like spinning the pistols cowboy-style."

But despite working on one of the coolest game engines around, some team members have their eyes on other opportunities. Both the lead programmer and "the dead" of working on a game with only a single main character," says Pardon. "Instead of a massive 50 playable characters with an OK moveset it would be really great to work on only one character with an amazing moveset. And as it would be a LucasArts license maybe that pipedream will come true after all. So watch this space for LEGO Indiana Jones: The Video Game."



Jedi characters in LEGO Star Wars: The Video Game have an extra joint in their forearm which enables them to use their lightsabers effectively

LEGO Star Wars: The Video Game is out now for PlayStation 2, Xbox and PC. There's also a Game Boy Advance version available (not developed by Traveller's Tales).



A Bill Oxen Pictures' new Gorillaz video, the first in nearly four years - hasn't Noodle grown since we last saw her?

Antoine Moulineau

After an absence of nearly four years Gorillaz are back with a new video that, as always, mixes 2D and 3D to great effect. We speak to the supervisor on *Feel Good, Inc.*

BY BEN VOST

Tell us about yourself...

I'm 25 years old and I discovered 3D nine years ago - I'm self-taught. Started my career at Duran six years ago - worked there for about four years. I was then freelance for different companies and I came to work for Puss'n'Pictures two years ago. In September last year came back to France to supervise a series at Def2Shoot and returned to Passion in February to work on the new Gorillaz videos.

How did you discover LightWave?

An Amiga fan friend of mine first showed me it in 1994 but I first used LightWave 4 on the PC in 1996.

What do you particularly like about LightWave?

What I like above all about LightWave is its clear readable interface and its simplicity. It always astonishes me to see the results that can be achieved in very little time. Its render engine is excellent quality too.

Do you prefer modelling, animation, texturing, lighting or rendering?

I find myself specialising more and more on the lighting/rendering/compositing side of things.

What's your favourite tool in LightWave?

The best tool in LightWave in my opinion is HyperVoxels - it was one of the most important factors in us deciding to use Lightwave for *Feel Good, Inc.*

What sort of computer are you using right now?

At home I have a Dell Inspiron 9200 laptop with a Pentium M 2GHz and 1GB RAM and at work I use a Dell dual-Xeon machine at 3.06GHz with 2GB RAM.

Are there any plug-ins you wouldn't be without?

Sosquatch is without doubt the plug-in I find indispensible in LightWave. It was used a lot to make the grass in the video.

How many people worked on the 3D side of 'Feel Good Inc'?

At the start of the project, one person created a layout and then five other artists came to model, texture and light

What's a layout?

It's a sort of animation where you set up each scene with low definition objects and simplified animation - it helps to largely



Although the characters in the video are completely 2D, this bass guitar is a 3D object created in LightWave



visualise a shot and check it works in editing before you really begin its production. It's kind of a more precise pre-viz.

How long did the project take?

I would say about six weeks for the 3D side.

What was your role on the project?

I was supervisor of the 3D side of the video, and more specifically in charge of the floating island and windmill in the clouds, along with the intro sequence.

What did being a supervisor entail?

I was in charge of finding the best technical solutions for scenes with tough technical challenges (grass, clouds, trees and very heavy geometry). I textured, modelled and rendered the shots with the island and windmill. I also had to do the camera mapping and the compositing for the intro shot.

Was the floating Island with the windmill inspired by Hayao Miyazaki's Laputa?

Yes, but the artistic director Daniel Carouaut, who also painted the skies, brought a luminosity to the scenes that was different to Miyazaki's - it gave the video just that bit extra.

How did you mix the 2D and 3D in this video?

The 2D's made traditionally - hand drawn on paper scanned and colour-ed with Toonz. Afterwards everything was composited in After Effects.

A mix of 2D and 3D is never easy. What was the hardest bit for you?

2D and 3D are two processes that are completely separate during the making of the video and yet they have to match perfectly when it's time for compositing. You have to work very carefully to the storyboard and layout so that you can check the cameras and scenes at the earliest opportunity.

Are the trees and clouds around the island in 3D? How were they created?

The trees were created in 3D in LightWave's Modeler and we generated displacement maps in Layout. They were calculated

separately from the island with a simplified lighting rig to keep down render times and give a little more flexibility.

The clouds were also created separately with a simplified island in a separate scene, with help from Lukasz Pazera working on passes for the cloud HyperVoxels while I worked on the island

How did you create the sequence where the island comes out of the clouds?

The biggest problem with this sequence was that we see the island both from right up close and very far away all in 350 shots. So we used a lot of compositing. To begin with, we had to define the different layers that needed to be made in 3D.

The first step, once the animation and the layout were signed off, was to render an Ambient Occlusion pass to avoid radiosity rendering during the lighting of the shot. It means that we had two renders, one with Ambient Occlusion, and the other one with the lighting. Afterwards, those two passes were combed together in After Effects.

We then needed to create the different layers, such as the grass, the island, the windmill and, finally, the sky (which had previously been painted). Once done, we then had a huge compositing job to put the 3D into the 2D sequence and finally we had to track and match the character in 2D on the screen.

As a Frenchman, how do you think you've succeeded at the heart of a very British company?

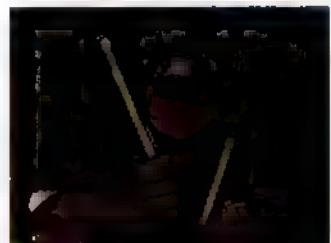
It's down to the fact that I had the chance to start my career a little more than six years ago at Duran [a large and famous French CG studio based in Paris] where I learned lots of things and had the chance to work on a lot of original and often well-known projects. The best examples of this previous work were the videos for Starlight and The Brotherhood of the Wolf by Nicolas and Christophe Gans.

What's the difference between CGI industries in London and France?

Today London is where the most interesting projects are being worked on. That's mainly what I miss in France.

What are you working on at the moment?

Right now I'm working on the next video for Corillaz. ●



• Russel plays a LightWave-created drumkit. The 3D elements of the video took around six weeks to put together



• The Island with the windmill emerging from the clouds was one of the hardest shots to pull off



• Sasquatch, the hair and fur plug-in by Worley Labs, was indispensable for the grass shots



• Several scenes with elements of varying complexity were used to create the final image in the video

MORE INFORMATION

You can watch the *Feel Good, Inc.* video at the Passion Pictures website [[w](http://www.passion-pictures.com/feelgoodinc.html)]

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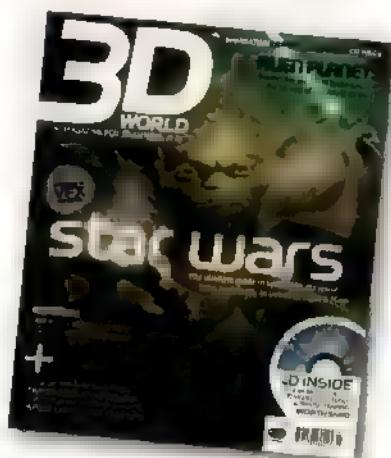
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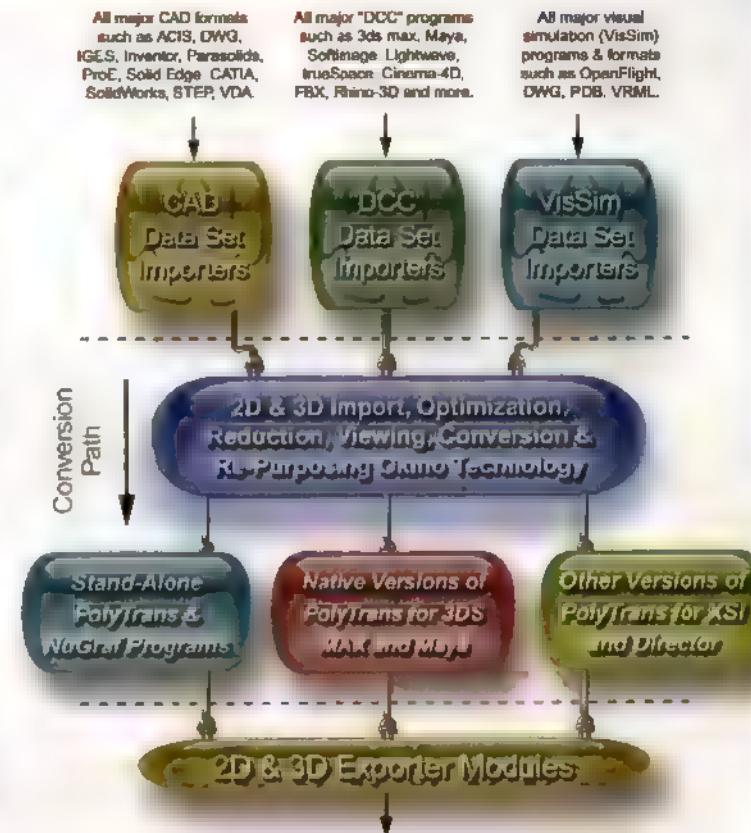
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Q&A

QUESTION & ANSWER SERVICE

QUESTION OF THE MONTH

Submitted by Geraldine Parker-Thomas, via email



You can create your very own Star Wars-style projection using After Effects. It's not as easy as the one in Star Wars, relatively speaking. In fact, the only problem you should have is deciding whether to be Luke or Obi-Wan.

AFTER EFFECTS

"How can I create a Star Wars-esque hologram scene using After Effects?"

This Issue's answer is supplied by Jan Rogowski of the UK-based effects and animation company Red Star Studio. Most of his fantasies have been fulfilled by directing a diminutive receptionist pretending to be Princess Leia.

So, you're waging a long and bitter galactic war and you're outnumbered and outgunned by the meless army of an evil emperor. The forces of the Dark Side have captured your spaceship and stretched the neck of its captain; defeat seems inevitable. Your only hope lies in somehow getting word to Sir Alec Guinness, a venerable Jedi of great power. But his moan's out of range: the post office has been privatised and FedEx has yet to go galactic. You turn to your trusty, hologram-recording droid to deliver the message personally. It's then you realise that holographic projection doesn't really exist. Damn. Your heart sinks, and in desperation you turn to an old copy of *3D World* for comfort. Flicking through its battered pages you

stumble across an article that breathes hope into your soul: so attach those Danish pastries, wield the mighty power of After Effects and repel the evil of the Dark Side! While holographic projection may be the work of science fiction, we can create the illusion relatively simply using a camera, a big sheet of blue paper, an office administrator and a firm grasp of visual effects.

R2CD2

This tutorial will guide you through the process of creating a hologram sequence using *After Effects* as a platform, but the theory is equally applicable to other applications.

On the CD you'll find example QuickTime movies, full walkthrough images and all the source material and *After Effects* project files required to create the sequence. If you're on a PC copy the *Hologram_QnA* to C:\ and the *After Effects* files will work; otherwise you'll have to load them and instruct *After Effects* to find the missing footage. Let's get started!

FACTFILE

FOR
After Effects 5.5

DIFFICULTY
Intermediate

TIME TAKEN
Three hours

ON THE CD

- Full colour screenshots
- Live action footage
- After Effects files
- Final QuickTime
- Composite effects shot

ALSO REQUIRED
N/A

STAGE ONE | Keying the bluescreen



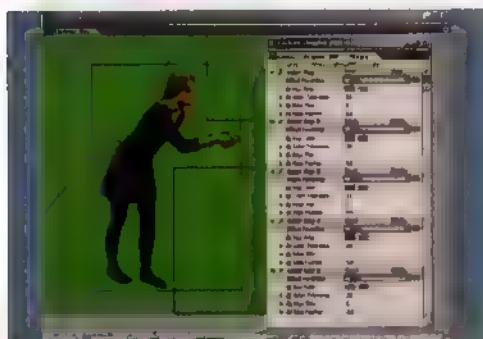
01 Create a new seven-second-long composition at 720x576 called Lindsey_Key; to simplify matters we're going to work with square pixels throughout this tutorial. Give it a plain green background colour. Import the bluescreen sequence of Lindsey and drag her on to the timeline. Make sure you interpret the footage, and tell After Effects it has square pixels and 25fps.



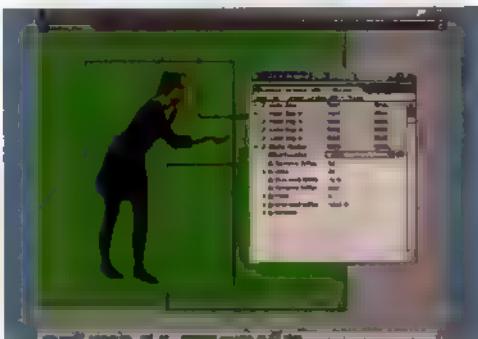
02 Use masks to remove as much of the background as you can. This is called a 'garbage matte'. Basically the idea is to trim as much of the screen as possible, so that the keyer has less background to remove. There's no set way to do this, you just animate masks to remove as much of the unwanted areas as you can.



03 Apply a Color Key (Effects > Keying > Color Key). Use the Eyedropper Tool to select an initial RGB value for the Key Color, and then the Color Tolerance value to specify a selection range. Don't worry about the edging options – just grab a shade of blue from the image and mess with the tolerance values to remove some of the blue.



04 The Color Key works by recognising colour values of pixels, and determining if they fall between your specified tolerances. Duplicate the Color key by selecting it and clicking Edit > Duplicate. Then use the Eyedropper to grab one of the remaining shades of blue, and repeat the process until all the background is eaten away.



05 There's a bit of blue halo remaining, so use one last effect to suppress this. Matte Choker (Effects > Matte Tools > Matt Choker) will shrink the edges of the Alpha channel to eat away at Lindsey's edges. The default settings work well, but have a go at changing the Geometric Softness (basically blurring the matte) and the Choke values to get something that looks good.



06 Import the first frame of the background plate sequence as a still image for reference, and drag it on to the bottom layer of the timeline. Resize the composition (Composition > Composition Settings). Set its size to 720x380 (all compositions will be this size from now on). Scale down the Lindsey layer to about 55% and position her above the marker on the table. Hide the reference image.

STAGE TWO | Setting up animated distortions



07 Start a new composition called Lindsey_Graded. Nest the Lindsey_Key composition into it by dragging it from the Project window. Adjust the Hue/Saturation (Effects > Adjust > Hue/Saturation), twisting the hue control to turn her blue. Boost the lightness to 20. Now add a Brightness/Contrast adjustment (Effects > Adjust > Brightness/Contrast), and boost the brightness by 25 and the contrast by 50.



08 Apply a Wave Warp effect (Effects > Distort > Wave Warp) to a new adjustment layer. Set the Wave Type to sine, the Height to 10 and the Width to 40. Leave the rest of the options as they are. Hit RAM Preview to see how the effect is distorting the image. Hit the keyframe button for Wave Height and key the height to be 10 at 0 secs and 0 at 2 secs.



09 Add another Wave Warp effect. Set Wave Type to Noise, and Width to 40. Key the height to 10 at 0 secs and 0 at 2 secs. Add more keys for a Wave Height of 0 at 3.5 secs, then 6 after 3 frames and then back down to 0 after a further 15 frames; this will add a blip of interference. Repeat for a further blip at about 5 secs.

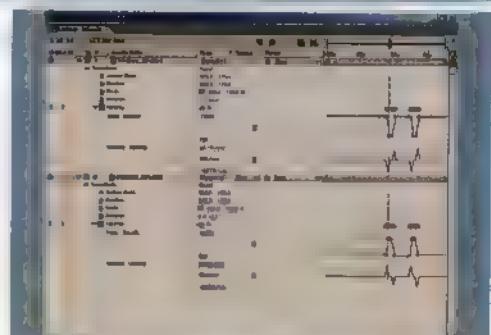
STAGE TWO (Continued) | Setting up animated distortions



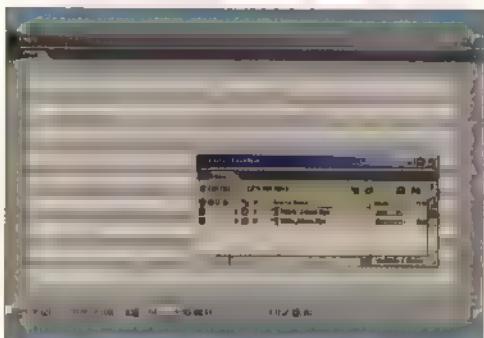
10 Duplicate Lindsey_Key. Remove the Brightness/Contrast effect from the bottom layer. Go into the Hue/Saturation options and desaturate the image while boosting lightness to full. Apply a Gaussian Blur filter (Effect > Blur and Sharpen > Gaussian Blur) set to 2 pixels. Go to Effect > Channel > Alpha Levels and boost the gamma to 2; this gives Lindsey a glowing halo.



11 Now introduce phase distortion to the hologram. Create a new composition called Lindsey_Phased, and drag our last composition, Lindsey_Graded, into it twice. Select the bottom layer and drag it around; you should see a second version of Lindsey. Set the X position of the bottom Lindsey slightly to the left, and set the opacity to 10; you should see a faint ghost of the image.



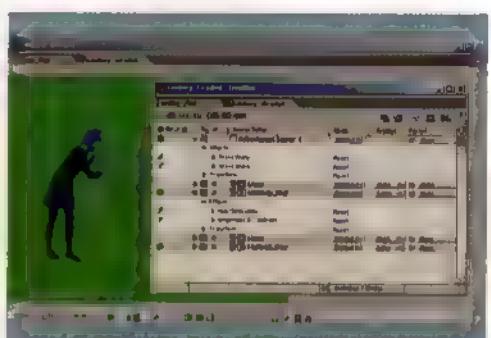
12 To achieve the phase effect, key the layer opacities to blend between the two layers. You should also time the phase shifts to match up with the distortion effects already in place. The basic formula I used was three frames to fade the bottom layer in, hold for four frames and a further three frames to return to the top layer.



13 Create a new composition called Lines to control the scan-line effect of the hologram. Import the supplied images Thin_Lines and Thick_Lines, arranging them on the timeline with the thick lines above the thin lines. Change the layer blending mode of the top layer to Add by hitting the Switches/Modes button to access the Layer Modes panel. Key the thick lines layer to slowly slide downwards.



14 Create a composition called Lindsey_Final. Drag Lindsey_Phased on to the timeline. On the layer above, drag the Lines composition (we'll use the luminosity values of the Lines layer as an Alpha channel. Set the Layer Options view to Modes. Change the Alpha Options for Lindsey_Phased to Luma Matte Lines. After Effects hides the top layer and Lindsey will become transparent and lined.



15 Currently the lines effect isn't being influenced by the distortion effect. This is because it's happening later on in the project hierarchy. If you're confident with the tutorial up to this point you might want to shift the lined effect further down the hierarchy by removing the Lines layer from Lindsey_Final and applying it to the two Lindsey_Key layers contained in the Lindsey_Graded composition.

STAGE THREE | Bringing it all together



16 Select the Lindsey_Final composition, and render out as an uncompressed full-res AVI, making sure you include the Alpha channel. Go back to the Project window and reselect the Lindsey_Final composition. Right click and select Set Proxy > File. Find your rendered proxy file and click OK. Bingo! Proxy applied. This will alleviate some of the render demands After Effects makes on your PC.

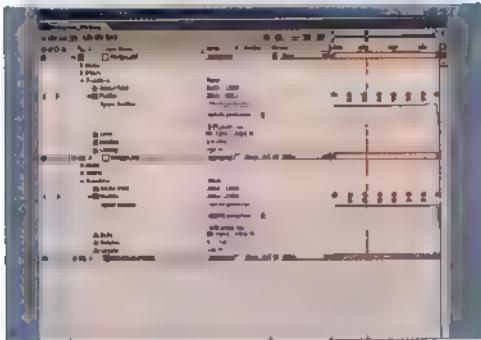


17 Create a new composition called Back_Plate. This composition will clean the background plate, removing the marker on the table. It's very simply achieved by using two layers, both containing the background footage. The top layer is offset and masked, so that we can use a small area of the table pixels to cover the marker on the bottom layer.



18 Create a new composition called Hologram_Striping. Drag in the Lindsey_Final composition. Add a new adjustment layer. Add a Brightness/Contrast effect, boosting the brightness to 70. Create a new Additive mask and resize and position as shown above. Now animate the layer positioning so that the stripe oscillates up and down Lindsey, taking one second to complete each turn.

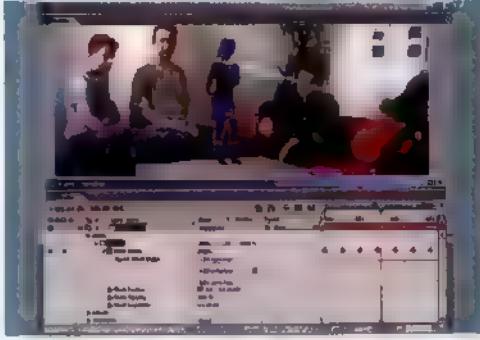
STAGE THREE (Continued) | Bringing it all together



19 You're animating the layer positioning because, by moving the layer and not keying the mask shape, you're free to adjust the width of the mask easily for subsequent tweaking. Once you're happy with the first stripe, duplicate the layer to create the second. Rearrange the position keyframes so that its oscillation mirrors that of the first stripe.



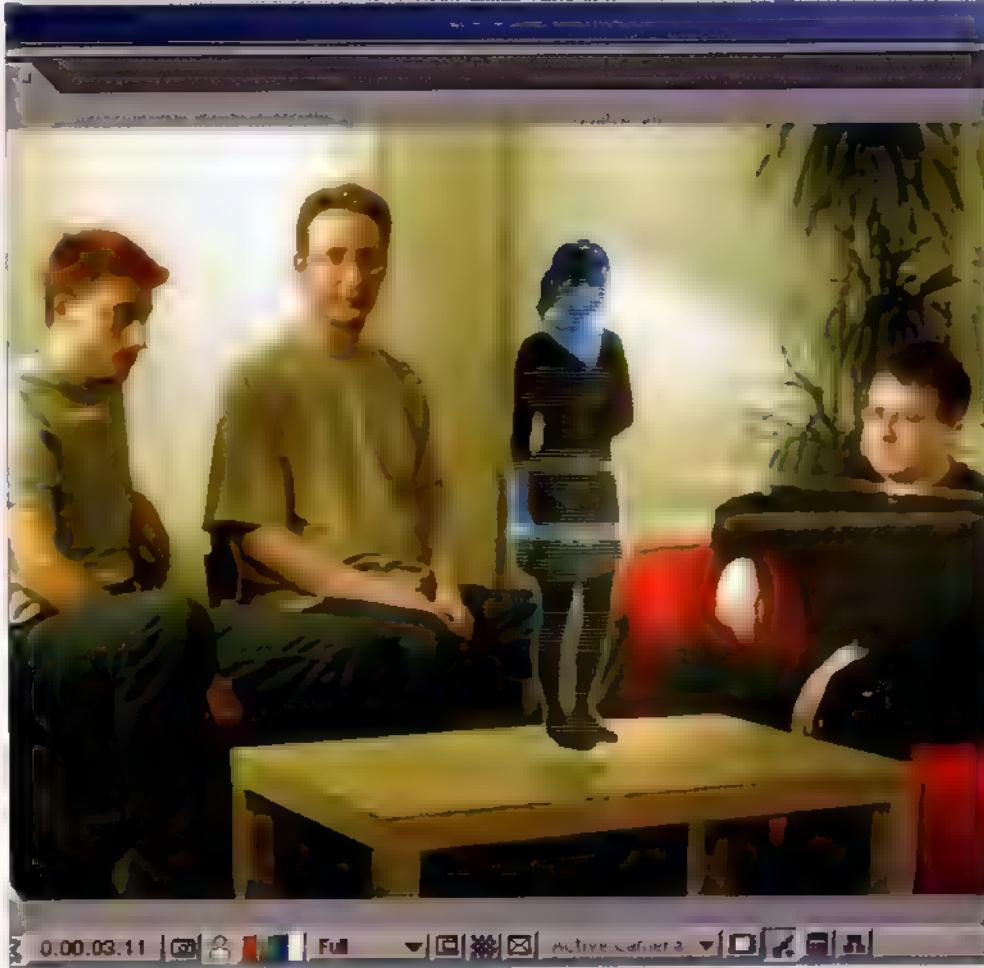
20 Now add the moving light beams. Make a new composition called Beams. Drag on the Back_Plate composition as the bottom layer and above it the Hologram_Stripe composition. Add a new adjustment layer with a Brightness/Contrast effect set to 70. Move to 4 secs. Create a new mask, this time with only three points. Set the feathering to 1 and arrange the mask as shown above.



21 Now key the shape of the mask to follow the stripes. You're animating the Mask shape, not the layer position, because you're deforming the mask. Key the Mask shape here at 4 seconds. Move to 5 seconds and translate the two left-hand points down to match the stripe. You now have two Y values for the beam movement, so make it oscillate in time with the stripe.



22 Add one last mask to this layer. Make it an elliptical mask, with mode set to Intersect and a feathering value of 100. Arrange it as shown. This gives the beam a gentle fall-off towards the end. Now duplicate the layer to create the second beam, rearranging the keyframes attached to the Mask shape values to reverse the motion.



23 Now add the glow radiating from the projector. To do this you're going to use an Adjustment layer and some animated masking. Apply a Brightness/Contrast effect to the Adjustment layer and boost the brightness by about 50. Add a mask, give it a feathering value of 20, and arrange it as shown. Animate the mask to follow Lindsey as she stands up.

24 The last composition you're going to use in this project will enable you to change the final look of the shot. I've used the Curves filter to suck some of the blue out of the image and also to boost the red and green channels. Create a new composition called Final_Grade. Drag the Beams composition on to the timeline and have a bit of a mess around, experimenting with as much of the After Effects

toolset as you can until you end up with something you're happy with. You can do lots of things to make this project your own: adjust the colours and the contrast, or isolate and bloom the highlights. You can also adjust the hue or saturation, and try to make it as weird and funky as you like. And remember, if you strike After Effects down, it shall become more powerful than you can possibly imagine... ●

Q&A

Our experts
this month...

3DS MAX

 Pete Draper finds that natural camera shake is best achieved by an excessive dose of caffeine (or lack thereof) www.xenomorphic.co.uk

ANIMATION.MASTER

 Shaun Freeman has taught Animation: Master to senior secondary students and is currently a freelance 3D artist www.shaunfreeman.com

CINEMA 4D

 Steve Rutherford is director of Computer Graphic Arts at the University of the Incarnate Word in San Antonio, Texas www.cga.uw.edu

HOUDINI

 Ben Schrijvers is one of the few Dutch Houdini users and is an FX animator at Framestore CFC in London, JK www.xs4all.nl/~bensch/cgfx/

MAYA

 Gary Noden works at 422 Manchester in the north of England, where he's recently taken to swatting his buckie www.422manchester.co.uk

MODO

 Nicholas Olinger has worked as an animator on many game titles and is now a freelance demo artist for Luxology www.luxology.com

PHOTOSHOP

 Leigh van der Byl is a South African-born 3D artist living in California. Her recent credits include *Sin City* and *The Aviator* <http://leighcgcommunity.com>

VUE 5 INFINITE

 Eran Dilnor is a 3D artist and animator. He's created sample scenes for Vue 4, Vue 4 Pro, Vue 5 Esprit and Vue 5 Infinite www.e-onsoftware.com

XSI

 Ola Madsen works as a 3D artist for a company in Sweden, animating everything from medical treatments to furry teddy bears www.digitalcontext.se

Quick Questions

No matter which 3D software package you use, our experts are here to help. Send us your query and we'll provide the solution: <http://forum.3dworldmag.com>



ANIMATION.MASTER | Simple muscle motion controls



I'm at the latter stages of my animation and am using Muscle mode to clean up deformations and generally tweak things. But I end up with a mess of channels to deal with. Any tips on how to get more control over muscle motion created in the choreography? **JOHN KEATES, FROM THE FORUMS**



Animating using Muscle mode can be done directly into the choreography. However, altering or changing the animation of the CPs (control points) can be very fiddly if done like this. A more effective way of animating CPs directly in the choreography uses pose sliders. An example of a situation requiring direct CP animation in the choreography might be if a female character rests her head on her hand, causing her cheek to distort as her fingers push the cheek upwards and out of position.

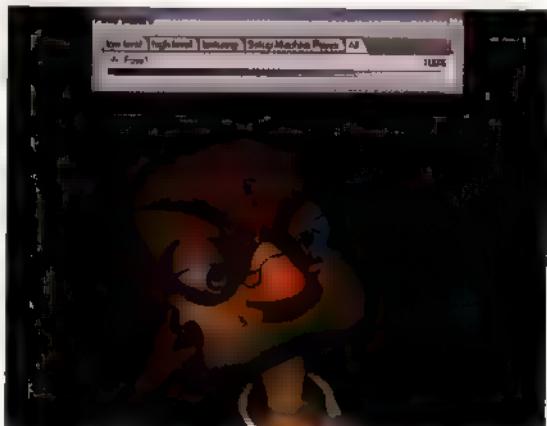
First, establish the pose with the character leaning her head in her hand. The hand can intersect the facial mesh, as CPs will be adjusted to mold to the hand later. Clicking on the Muscle mode option, the CPs are directly manipulated to distort around the hand appropriately. The adjusted CPs turn blue, indicating a keyframe has been created for them. Although this is done in the choreography, to animate the cheek area pushing down into the fingers causing this squishing effect would be quite complex if done by directly editing CP keyframes. The next step is to create a pose slider to control this process.

To create the pose slider, you should now select the area of the model, which has had the CPs altered. Press [Ctrl]+[C] to copy the CP keyframe data to the computer's clipboard. In the project workspace, right click on the model, select New > Pose > Percentage, to create a new Percentage pose. A relationship window will open. Ensure that the pose is at 100%, select the area containing the edited CPs, and press [Ctrl]+[V]. This pastes the CP keyframe data into the newly created pose.

The CPs associated with keyframes will now shift to their new position.

All you need to do now is to remove the initial CP keyframes created in the choreography. To do this, return to the Choreography window, select the area containing the edited CPs and, from the Edit menu, select Delete Keyframe.

This technique removes the process of having to animate individual control points, which would be frustratingly time consuming and tricky, and allows you to carry out quite complex muscle motion, which is then controlled by a single pose slider (SP).



The newly created Pose slider is really effective, as it can be used to manipulate the mesh in the choreography, so you don't have to worry about all the individual keyframes created by the CPs.

CINEMA 4D | How do I get logo text from an Illustrator document into C4D?

TACEY, VIA THE FORUMS



01 Prepare in Illustrator

First, you need to make sure things are appropriately prepared in Illustrator. Select all your text and make it Outlines (Type > Create Outlines). Simplify the curves by combining any type shapes that overlap and are the same colour (unless they're to be animated separately). If shapes overlap, drag them apart before exporting. Use File > Export to export an Illustrator legacy file. Change the version setting to Illustrator 8.



02 Load exported file

In C4D, you can load the exported file by selecting either File > Open or, in the Objects manager, choosing File > Load Object. When you import the .ai file it will import a Null object with all the splines as its children. Check to see that 'holes' in letters really are holes and not separate splines. If they are, select the outer shape and the hole shape splines and select Functions > Connect.



03 Extrude each letter

For animation flexibility, extrude each letter or part of the logo separately. Place each spline in its own Extrude NURBS object. Label them so you don't get a load of unknown extruded splines. And finally, as you create the new Extrude NURBS shape, make sure you use the Object Axis tool to get the axis of rotation in an appropriate place in the centre of the extruded object. (AW)

MAYA | Faking a heat haze

Do you have any ideas on how to generate a heat haze in a scene? **ESCOOLER**, FROM THE FORUMS

You want to do a heat haze using Maya and no compositing software? Good luck! It's not easy, as you need a compositing package to blend two renders in order to create the subtle distortion of rising hot air refraction. But you can do this in Maya, just in a very indirect way.

Animate your scene and then put particle-emitting tiles into your engine vents. Set them to emit multi-streaks with a short lifespan. Turn the particle's colour accumulation on, and add a colorPP attribute using a Colour ramp from dark grey to black, adjusting it to avoid large patches of white in your renders. Give them a small amount of reversed gravity to simulate hot air

THIS IS POSSIBLE IN MAYA, JUST IN A VERY INDIRECT WAY

Now turn off the particles and render out a Colour pass. Turn the particles back on, set the render engine to Hardware, turn on Enable Geometry Mask in the Render Globals, save the animation under a new particle type name, and render again.

Create a new scene with the same resolution settings as before. Create a NURBS or polygon plane and point it at a locked camera, making sure it fits exactly to the camera's resolution gate. Turn off the default light setting in the Render Globals. Open the Hypershade. Create a Lambert shader, assign it to your plane, and connect your pre-rendered Colour pass as an animating file texture to its Incandescence. Now create a blendColors and connect its outColour.R into the Incandescence file's place2dtexture node offsetX, using the Connection editor. In the blendColor's blender, connect your particle pass render, setting it as an animating texture too. Set its filtering to Gaussian and then set the filter to about 3. Set both colours in blendColors to black, and bring up value of colour1 by a tiny amount. The value of this colour will add itself to the Texture placement of your colour pass, and distorts it as a result. (GM)



Q&A TIP

- This UV distortion technique can be really useful for creating smoke and also for faking certain displacements such as the sandstorm 'face' in the film *The Mummy*.

- Think of your particles as a UV Bump map: the more variation there is between black and white, the better the resulting distortion will look. Here's an example of the composite, along with a visual guide to the shader created, with some colour added to the Incandescence

MODO | Workflow in modo

 I'm having trouble understanding Action centers and the Tool pipe. They just seem weird to me, and I'm not sure how to use them in my modelling workflow. Can you help?

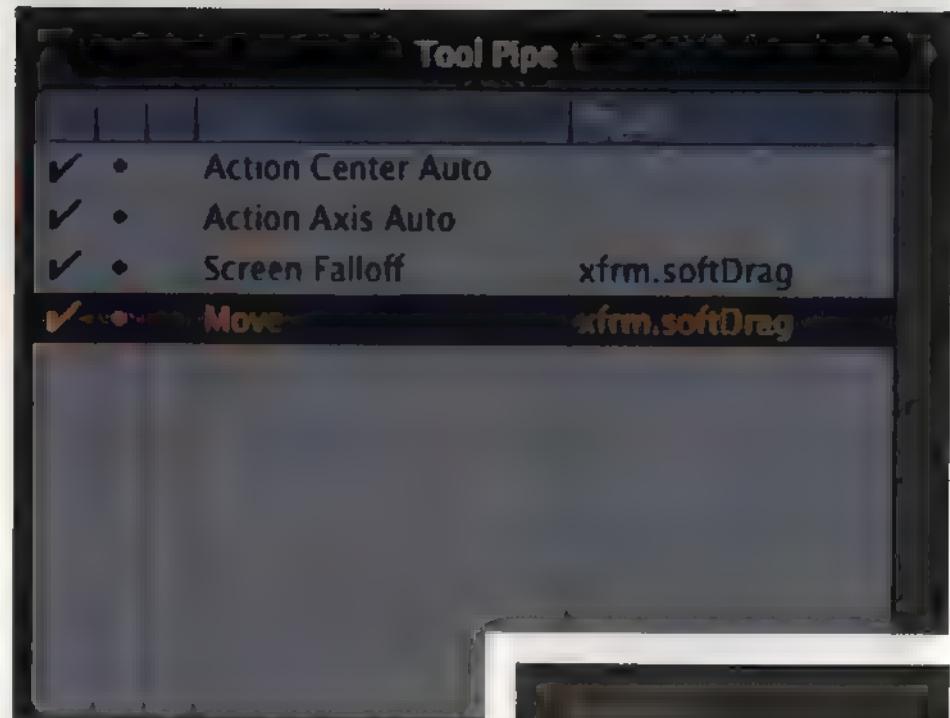
KORI, VIA THE FORUMS

 I was recently doing a demo of modo at the Game Developers Conference and this question came up several times. It's an important query because understanding how these aspects work together is fundamental to your comprehension of modo. Tools in 3D space need both an axis centre and an axis defined before they can perform their function. modo offers eight Action centers to choose from; each one offers a different method of defining this information for the tool. The default Action center in modo is automatic. In this mode, once a select on is made and a Transform tool is invoked, the handle will centre on the selection and align to the World axis. If you needed to align a certain piece of geometry to another, this mode would not be ideal. Instead, you should use the Selection mode, where the centre and the axis will align to whatever piece of geometry you choose, making it the right mode for your task. With modo, it's not about learning how to use a programmer's notion of how things should work, but rather deciding for yourself how you'd like to work.

Before I move on to the second part of Kori's question, I'll quickly address falloffs in modo, as they play an important role in understanding the tool pipe. modo offers eight falloff modes, which basically feed information to the current tool to determine which vertices are affected by the tool and by how much. The combination of Action center falloffs and tools is done in the Tool pipe.

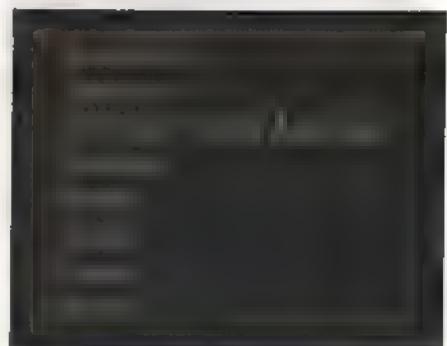
The Tool pipe allows the user to compose tools with various Action centers and falloffs, enabling them to create custom tools. An example of this would be the Soft Drag tool in the Deform tab. When you activate this tool, you'll see (in the Tool pipe) that this is actually the Move tool, combined with a screen falloff using an automatic Action center (see the screenshot on the right).

To summarise, the Tool pipe allows for extreme flexibility within modo, and provides the 3D artist with the ability to compose new tools by combining these elements - pretty handy [NO]



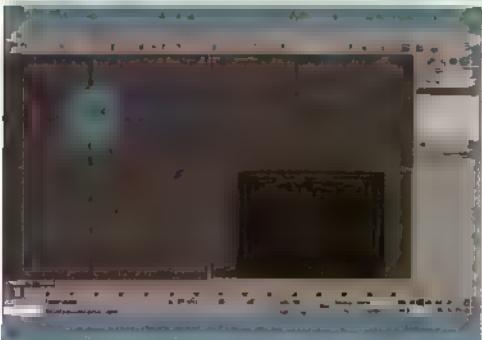
modo's Tool pipe lets users compose tools with various Action centers and falloffs, effectively letting them create custom tools.

modo offers eight Action centers to choose from, each offering a different method of defining this information for the tool.



WITH MODO, IT'S ALL ABOUT DECIDING HOW YOU'D LIKE TO WORK

3DS MAX | How to get a more realistic handheld-camera animation in 3ds max



01 Open scene files

Open the cameramotion_start.max file from the CD. Here we have a basic dynamics setup to follow with our camera, which is already included in the scene. Add a Dummy object to the scene, and label it 'Dummy Camera'. Create another one and label it 'Dummy Camera Target'. Next, add the random motion to the dummies to link the camera and camera target objects too.



02 Function Curve editor

Open Function Curve editor and navigate to the Dummy object's Position Transform controller. Replace the existing controller with a Noise controller. Reduce the intensity by setting the X, Y and Z strength to 5 and frequency to 0.02. Right click the controller, and select Copy Paste into the Dummy Camera Target's Position controller. In this new Noise controller, set the Speed to 1.

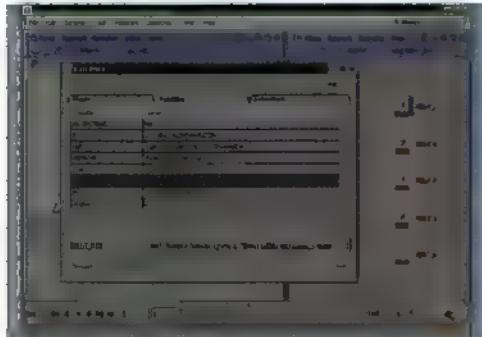


03 Link camera and target

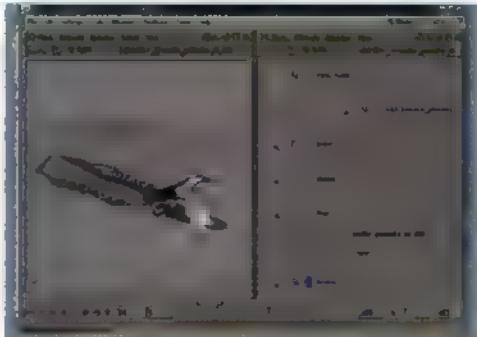
At frame 0, link the camera and target to their respective Dummy objects. Play the animation to test. You need to animate the position of the camera target to focus on the scene. A good way is to reframe every 10 or 20 frames. Additionally, try animating the camera lens size to quickly zoom in and out of the scene - a fast zoom in (or out) over five or ten frames gives a nice result. [PD]

How can I deform and animate a model like it's melting?

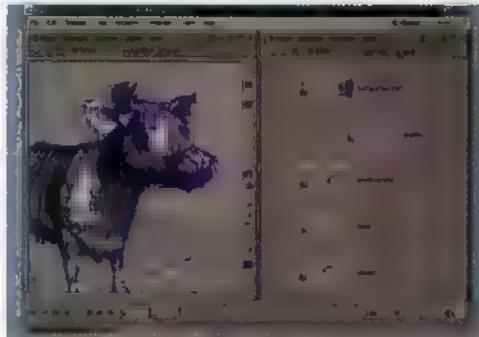
JOEL EINHORN, VIA EMAIL

**01 Create a directory**

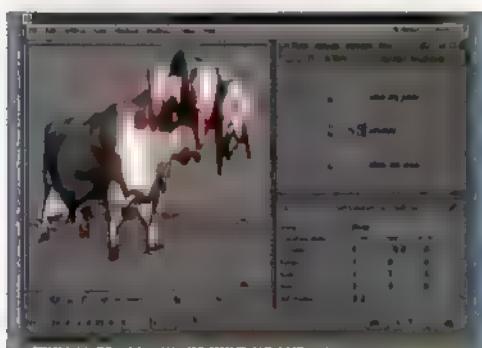
Melting needs a method you could call a feedback loop. Each frame, you deform geometry, save it to disk and load that file back in again next frame. Create a directory on a disk in which to save those files. Open the melting.hip file from the CD. Hit [Alt]+[A] to open the variable window. change MELT_DIR to the directory.

**02 The basic feedback loop**

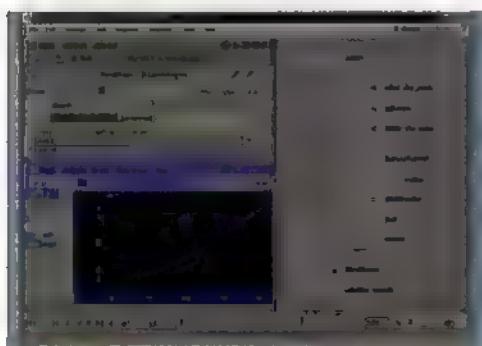
Enter the object MELT_2. Select the ROP Output node and hit Render. After rendering, hit Play. Although the xform node's values are constant, the nature of the feedback loop means that this constant transformation is applied to the geometry every frame - which creates the animation. Click MMB on each node to read extra comments.

**03 Flow along the surface**

Replace the xform with a SurfaceFlowVOP node to calculate custom normals. Append a Scatter and AttributeTransfer the normals back onto the model. This will blur N in 3D. Append a Peak by 0.1, append a Smooth node and connect it to the floor node. We only need one smooth iteration as the feedback iterates already. Hit Render.

**04 Adding some dripping shapes**

To add drips, Insert some more nodes inside the loop. Create a points group with the expression rand(\$PT+int(\$F/5))>0.95. This selects five per cent of the points and changes seed every five frames. SoftTransform the group down by -0.2. Append a Group to delete the point group. The group will be created again next frame.

**05 Controlling the animation**

To make the effect less linear we need to animate the amount of deformation. Add a blendShapes to blend between the Switch and Smooth. Keyframe the blend parameter to go from 0 to 1 and change the curve to a easein(). To compensate the slow start, Peak and SoftTransform need to be 3x stronger.

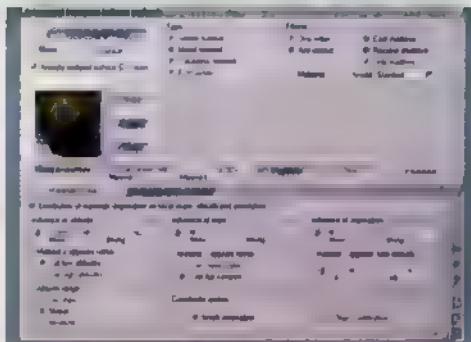
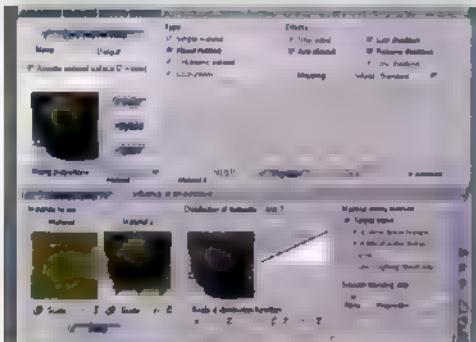
06 Creating a Melt Operator

This will give you a basic idea of how to do melting in Houdini. There's more that can be done to refine the effect so feel free to add more operators in the loop if you want to. I used a cow for a bit of a laugh, but you can apply this effect to any model you like. Just make sure the model you do use has enough detail to work with. A really

cool feature in Houdini is that you can collapse the network you just created above into a new custom operator. It took me about ten minutes to create this so-called Houdini Digital Asset and it's used in MELT_6. All the relevant parameters to control the melting are now together in one interface. So next time you need a melting effect, just use the Custom Melt node. (BS)

VUE 5 INFINITE | How can I use an EcoSystem to scatter trees just along riverbanks?

MICHAEL K. VIA EMAIL



Load the scene file

01 Load the scene file. Select the terrain, and open the Material editor. Switch to Mixed Material mode. For material 1 load Fields from this issue's CD. For material 2 load Riverbank_trees. This is a simple EcoSystem material with maple and plum trees. Click Populate, and notice how the EcoSystem covers the whole terrain with trees.

Use altitude influence

02 To scatter the trees along only the riverbanks, switch to the Influence of Altitude tab, and set material 2 to appear at low altitudes (50%). Set Influence of slope to 0%, and mixing proportions to 50%. Switch back to the Materials to Mix tab, raise the Smooth Blending strip to 42%, and click the populate button.

Add colour variations

03 Now add some colour variations to the EcoSystem, by modulating a Colour map with a noise function. In the Material editor, Double click on Material 2. Select the Colour tab, and turn on variable colour. Double click on the Colour swatch, and load Eco_colors from the accompanying CD. Double click on the function swatch, and load Eco_noise. Click OK, then click the populate button to see the result [03].

PHOTOSHOP | Alpha channels in textures

Can you tell me how you utilise Alpha channels in textures to blend different texture images together on a model? **FELIX WILKINSON, VIA EMAIL**

Alpha channels are additional channels imbedded in images that allow for transparency information. Using an Alpha channel you can essentially tell a piece of software to ignore parts of the image. They work in shades of grey, with white areas of the channel being 100% opaque, black areas treated as transparent, and any grey areas treated as semi-transparent.

Using Alpha channels is, therefore, an easy and effective way of letting you tell your 3D software to ignore parts of texture images that are applied to the surfaces of 3D objects. This technique can be used with any 3D application and works for textures that are applied in standard UVW projections, as well as UV unwrapped textures. However, in order for it to be effective, the different areas that have separate images applied

ALPHA CHANNELS MAKE TEXTURING EASY AND EFFECTIVE

to them should overlap by a few polygons, as these overlapping areas will be where the blend takes place.

To start, create an Alpha channel in Photoshop, by going to the Channels palette, and selecting Channel > New Channel. By default, newly created Alpha channels are black. Bearing in mind that the white areas of the Alpha channel are the areas that the 3D image will regard as solid, fill the Alpha with white, and then feather off the edges using a black brush with a soft edge. When applied to a model as a texture, this area will fade to transparent, so that if this particular texture is layered over another one, the edges will fade off to reveal the underlying texture as demonstrated in the image to the right.

When using this technique with more detailed UV maps, make sure you create your Alpha fade-off along the actual seams of the UV map itself, as opposed to the edges of the actual image [008].



Q&A TIP

- Make sure you use varying shades of grey in your Alpha channel. Instead of plain black and white, to avoid really hard transitions.

- The image and its alpha channel. The black edges will cause the texture to fade to 0% opacity when applied as a texture.



SOFTIMAGE XSI | Separating different deformations

Q I'm trying to model a phone cord, but the geometry gets all twisted. How do you go about creating one in XSI?
MARK ANDERSON, VIA EMAIL.

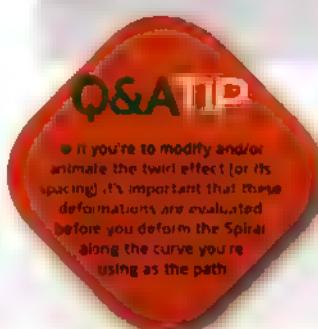
A While the phone cord itself isn't necessarily that complicated, it does show how crucial it is to plan through the modelling phase before pulling and pushing points around in 3D space. If the deformations are applied incorrectly, you'll run the risk of getting unwanted distortions in your geometry, or worse: not achieving the desired result at all.

Start by drawing a rippling CV curve in the top viewport, with a length of about 25 units. This will form the general shape for the cord, so whenever you want to change (or animate) the

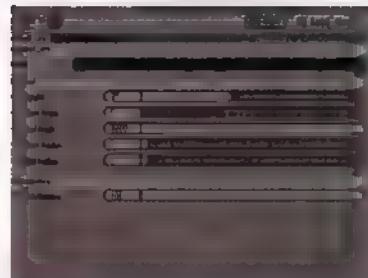
PHONE CABLES SHOW HOW CRUCIAL IT IS TO PLAN YOUR PROJECTS

flow of the cord, this is the place to do it. To establish the twist for the cord, you'll need a separate object. From the Primitive > Curve menu, click Spiral and set the height to 20 units. The radius should remain the same throughout the length, so set both the Start and End radius to 1. You'll need many more twirls than the default settings, so increase the End Angle to 9,000 (adding up to 25 loops) and change the Subdivisions to 100 to smooth the curve. Any additional effects or modification should be applied to this object.

Finally, create the actual profile of the cord. In the top viewport, draw an oval-shaped CV Curve and from the Modify > Curve, click Open/Close to close the curve. With the curve still selected, click Create > Poly Mesh > Extrusion Along Curve and pick the Spiral curve. Change the Subdivision Type to Absolute and increase the Vabs to 200. Select the Spiral and click Modify > Deform > By Curve. Pick the path curve and change the deformation Axis to Z-axis. Select the profile curve again and rotate it along the Y-axis to make it align with the cord. Press (+) to subdivide the mesh, making it smoother. (OM)



- Your success in creating this phone cable relies on your deformations being evaluated in the right order



- Using separate objects for your deformations ensures that each will be evaluated in the order and manner you wish

CONUNDRUM | Send us your solutions to this month's brainteaser

Each issue, we set you a real world 3D problem to solve. The sender of the best solution will win selected training resources. Our conundrum for last month was posed by Cinema 4D R9 user Dimitrios Christou, who contacted 3D World to ask:

"I'm trying to animate blood flowing down a wall for a horror scene. How can I make it move realistically? I thought that using metaballs might solve the problem, but found the resulting scene almost impossible to animate. I don't have Thinking Particles and am now trying to make my standard emitters do the work."

As with many things Cinema-related, forum regular Dr Monkeyface came up trumps. Ignoring the trial that the blood would leave on the wall, the particle solution is as follows: Create a Polygon object and place one point in it at 0,0,0. Next, create an emitter and a Metaball object. Drop the Single-point object into the emitter and drop that into the Metaball object. Create a Gravity object. Scale it up to fill the area and add a Deflector created as a simple Plane object as a wall, then created a Deflector object and scaled it to the same size as the wall. Change the elasticity setting to 0% or the particles will bounce when they hit the wall. Place the emitter facing the wall and just in front of it.

When you start the emitter, the particles appear right in front of the deflector and, thanks to the Gravity object, slide down the face of the deflector. If the wall and deflector are in the same place, the Metaball object will appear to be sliced in half. By adjusting the gravity, you can control the rate at which the 'blood' flows, by increasing or decreasing the metaball hull, you can change the density of the liquid.

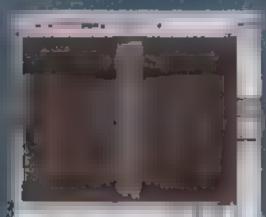
The full solution, including the emitter settings, can be found in the Cinema 4D section of the forum, along with Dr Monkeyface's second solution: a more controllable method using morph targets. Congratulations to the good doctor: a prize is in the post.

THIS MONTH'S QUESTION

Our conundrum for issue 66 is posed by Mat Kennedy, who contacted 3D World to ask:

"I want to imitate that 'globe' logo you have at the top of the pages in your magazine. But how do I create that 'liquid glass' look? I'm using SoftimageXSI!"

As ever, you can post your solutions on the threads in either the General Discussion or software specific sections of the forum. Good luck!



Gravity, a deflector and metaballs are the key to creating flowing blood with standard Cinema 4D particle emitters. Full solutions can be found on our forum.



Training resources

Post your solutions to the conundrum on our forum, and the one we think is best will earn its author a selection of 3D training resources...

Forum | Post your answers at
<http://forum.3dworldmag.com>

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ST 9
Fabulous
Fabrics



Amazing
Sci-Fi



Home
& Office
Furniture
Models



City
Building
Models



Suburban
House
Models

Coming up | NEXT ISSUE



IN ISSUE #67

HEAR US ROAR - 21 JUNE 2005



REVIEWS

HARDWARE / SOFTWARE / BUYERS' GUIDE



On test this issue
(clockwise from top right):
rockdirect Xtreme Ti,
Alienware MJ-12m, Sony
VAIO VGN-A397XP, Dell M70,
HP Compaq NX8220



3D portables

GROUP TEST Being on the move doesn't mean having to compromise productivity. With these portables, you can take your work with you

BY MAT BROOMFIELD

Wether you have a long journey to work, or you often find yourself away from the office, or just need to present to clients at their premises, a portable computer expands your horizons. These days, portables have divided into two general categories: laptops, and mobile desktops. Laptops are small and light enough to carry in a bag - they're ideal for working on trains and planes. However, they generally sacrifice performance for portability. They'll usually run using reduced power components such as the Centrino-based Pentium M processor family, and they'll have smaller screens. Mobile desktops, on the other hand, provide superior performance. They're usually too large and heavy to carry around by hand for much distance, and their battery life is generally too short for any serious amount of work. But they do include desktop processors and large, high-resolution screens.

This issue, we've assembled five machines we think will be suited to the 3D professional. Some fit neatly into one of the

categories mentioned above. Others are hybrids, offering excellent performance in some areas, and retaining complete portability.

When selecting a portable computer for 3D use, there are a number of key elements to consider, the most important of which are the processor (CPU) and graphics chip (GPU). The weighting you give to each of these depends upon your intended use. The GPU is important because it enables the display of your DirectX or OpenGL

3D scene. Without a GPU, the CPU is responsible both for calculating the content of your scenes, and creating the display. Not only does this burden the CPU, but so-called software rendering is

slower and can't cope with sophisticated effects such as shaders.

Lesser considerations will be the amount and speed of the memory, and the size, resolution and quality of the screen display. All our suppliers use DDR2 memory, which is twice the price of its predecessor. As a result, some only include half a megabyte. In order to keep costs down, with lots of ports for adding additional devices, all are expandable, enabling you to increase their functionality if required. So let's see how you can increase your productivity...

IF YOU HAVE A LONG JOURNEY, A PORTABLE EXPANDS YOUR HORIZONS

KING POINT | Improving the display

TO MANUFACTURERS HAVE recently taken a step forwards in display technology. Sony's X-Black system increases contrast and, using a special coated laminate, distributes light more evenly across the surface of the panel to eliminate the areas of colour variance that have frustrated graphics professionals, who require excellent colour purity.

Other manufacturers have attempted to walk in Sony's footsteps, and the Alienware machine has a version called Clearview. This appears to be a simpler version of X-Black - a coated glass laminate is fused to the screen. This increases contrast and colour clarity, but reduces the viewing angle, and makes the screen more sensitive to bright lighting within the room.

DETAILS**PRICE**

£3,106 / \$5,902* / €4,544*

*Currency conversion
(All prices include VAT)**PLATFORM**

Windows

MAIN FEATURES

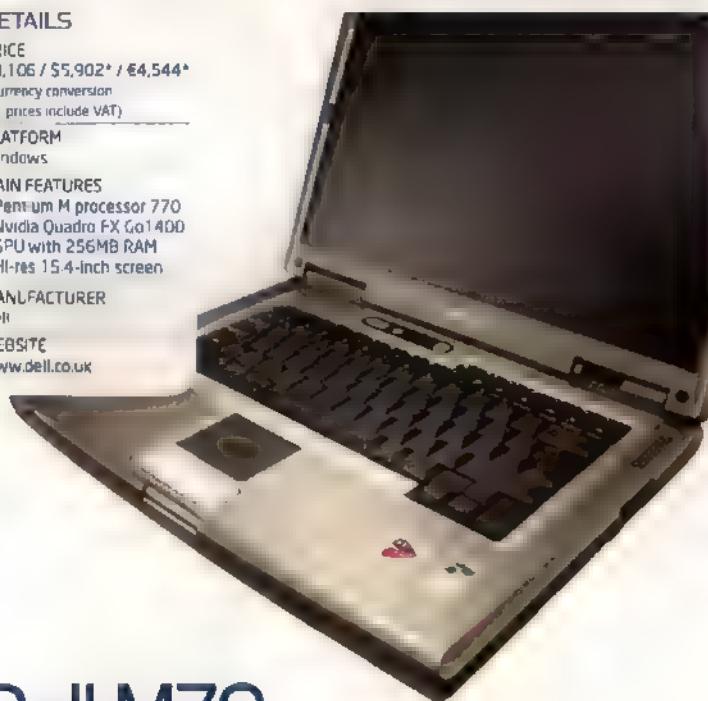
- Pentium M processor 770
- Nvidia Quadro FX Go1400 GPU with 256MB RAM
- Hi-res 15.4-inch screen

MANUFACTURER

Dell

WEBSITE

www.dell.co.uk



Dell M70

When money is no object, there aren't many more powerful 3D laptops than the Dell M70



Few people need blistering 3D performance on the move, but if you're one of those people who needs to work away from mains power for extended periods of time, there's no better option than the M70.

At the heart of the system is an Nvidia Quadro FX Go1400 GPU. This is the fastest mobile processor that we've encountered in a long time, exceeding (by at least 200 per cent) the OpenGL performance of the Radeon X600 and X800 and the Go 6800. The DirectX numbers aren't quite so formidable, illustrating well above board driver optimisation in what Nvidia considers a secondary API for the 3D professional.

The M70 uses a Pentium M processor 770. This is currently the fastest mobile processor available by which we mean it's intended specifically for the mobile user, unlike the Pentium 4 - which is found in the Alienware and RockDirect systems. Its performance is slightly below a 3GHz desktop Pentium 4 (as found in the RockDirect Xtreme).

This machine has every possible enhancement to ensure optimum performance. A though it only has a

15.4 inch widescreen, it runs at a hugely impressive native resolution of 1920x1200 and, just like its competitors, it can support a second monitor. With 2GB of fast DDR2 memory, you won't find your RAM acting as a bottleneck either.

The system only includes a 60GB hard drive, which is a potential limitation. Worse still, it doesn't have a FireWire port, so you're limited to adding any external storage you might want to use via the USB ports.

Although others have faster CPUs, if 3D performance is a primary consideration to you, they simply don't come any better than this system, and it has enough power optimisations to provide a quoted battery life in excess of three hours.

VERDICT**PROS**

- Powerful 3D
- Superlative warranty
- Excellent battery life

CONS

- Expensive
- Small hard drive

RANGE OF FEATURES

8

VALUE FOR MONEY

7

OVERALL

8

DETAILS**PRICE**

£1,902 / \$3,613* / €2,783*

*Currency conversion
(All prices include VAT)**PLATFORM**

Windows

MAIN FEATURES

- Pentium M processor 760
- ATI Mobility Radeon X600 GPU with 128MB RAM
- 17 inch X Black Screen at 1920x1200

MANUFACTURER

Sony

WEBSITE

www.sony.co.uk



Sony VAIO VGN-A397XP

You know you're going to get great style with Sony, but what else can this system provide?



You don't pay as much for the Sony brand as you used to, but it still commands investment.

This is the only one of the three 17-inch systems that uses a mobile processor, and that appears to be why it can claim a battery life of almost two hours - in spite of its extra-bright 'X-Black' screen. Of course when a portable operates on batteries, screen brightness diminishes, as does CPU and GPU performance. The whole point of the Pentium M's Centrino technology is maximisation of battery life, not optimisation of performance.

This system uses a Pentium M processor 760, placing it joint last with the HP model in terms of CPI performance. It also uses an ATI Radeon X600 processor like the HP, but maybe it was the choice of motherboard or the installed drivers, but the version in the Sony VAIO seemed less stable than the HP chip. It failed to complete two of the OpenGL tests and where it did finish, it offered generally decent performance albeit worse than the supposedly identical HP processor. Its Direct X performance was less impressive, which

surprised us, given the fact that A tends to achieve good performance in this area. The VAIO's 17-inch screen runs at a 1920x1200 resolution but the system only comes with 512MB of RAM.

Following Sony's lead for supporting its own technology, in addition to its Type I and I PCMCIA slot, the VAIO also has room for a Memory Stick. This makes it an ideal companion for a digital photographer using a Sony camera or camcorder. The machine is lighter and more compact than the other two 17-inch models, but is still larger than we'd want to take on trains and buses.

Overall, the system is elegant to use and look at, but it falls short in the performance stakes.

VERDICT**PROS**

- Stylish
- High-resolution screen

CONS

- Expensive
- Relatively slow CPU
- Inadequate memory

RANGE OF FEATURES

6

VALUE FOR MONEY

6

OVERALL

6

**DETAILS**

PRICE
£1,643 / \$3,120* / €2,403*
*Currency conversion
(All prices include VAT)

PLATFORM
Windows

MAIN FEATURES

- Pentium 4 3.0 GHz CPU
- ATI Mobility Radeon X800 GPU with 256MB RAM
- 17-inch screen at 1680x1050

MANUFACTURER
rockdirect

WEBSITE
www.rockdirect.com



rockdirect Xtreme Ti

If you're on a budget, rockdirect's generous three-year warranty avoids nasty expenses down the line

Many small companies need to plan their expenditure months or even years in advance, so an unexpected expense such as replacement or repair of a laptop can be disastrous. With its three-year collect and return warranty, the Xtreme Ti is one portable that won't be springing any surprises on you.

It uses the same chassis as the Alienware machine, although the lid is a brushed metal one rather than the MJ-12m's contoured plastic. It features a Pentium 4 running at 3GHz, which provides 1.2W in the second job, performance in this round-up. The Xtreme's Radeon X800 GPU provided the best DirectX performance exceeding the nearest rival by more than 30 per cent. If you regularly work with Microsoft's High Level Shader Language, then it's an ideal partner for you.

A though ATI claims that this gathering GPU is the fastest in the world, its OpenGL performance was performing well in some areas and not in others, so you'll need to consider this aspect on an application-by-application basis. While the Xtreme may share the same housing as

the MJ-12m, everything within is customisable. It also has a nicer, less reflective screen, albeit one that runs at a 1680x1050 resolution. It's odd in a system with such a relatively small drive that it should include a RAID controller. This can be used to improve performance in a dual drive system.

The Xtreme Ti seems to be suffering from a personality disorder. It can't decide if it's a workstation or a games machine. We feel it's a workstation wannabe - with a paltry 512MB of memory and a 50GB hard drive, the Xtreme Ti is targeted at games users. Don't let that put you off; the system is scalable and you can always bump the specs up to something suited to your creative needs.

VERDICT**PROS**

- Powerful
- Great DirectX performance
- Large screen

CONS

- Small hard drive
- Inadequate memory

RANGE OF FEATURES**VALUE FOR MONEY****OVERALL**

8

7

7

DETAILS

PRICE
£1,526 / \$2,899* / €2,233*
*Currency conversion
(All prices include VAT)

PLATFORM
Windows

MAIN FEATURES

- Pentium M processor 760
- 15.4" screen at 1680x1050

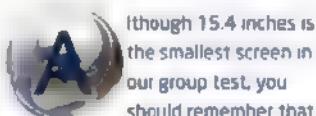
MANUFACTURER
HP

WEBSITE
www.hp.com



HP Compaq NX8220

When you want laptop portability at an affordable price, HP has a solution that fits the bill



Although 15.4 inches is the smallest screen in our group test, you should remember that many people are still using smaller displays on their desktop. Like all its group rivals, the NX8220 uses a widescreen aspect ratio, which makes the display appear smaller than one with a conventional 4:3 ratio. Nevertheless, with a resolution of 1680x1050, there's more than enough space for you to be highly productive.

On paper, the machine's Radeon X800 GPU comes out the worst in the test, but this wasn't borne out by the benchmarks. While the machine is coming in at around halfway up the table, like the Sony machine, it scored well in some OpenGL tests and poorly in others. One area where it did well was in its DirectX throughout it came last, with a poor 3DMark 2005 rating of 945. This has it coming in below even the Sony system, which uses the same chip. To a certain extent, we had hoped that ATI's workstation DirectX driver optimisations might have been applied to the laptop too, but unfortunately that seems not to be the case.

The CPU is also the same as the Sony's - a Pentium M processor 760. This is a system designed for use away from a power supply, so the Centrino savings are perhaps the most meaningful with this system. Every part is optimised to maximise battery life. It's a shame then that HP won't quote an expected battery life for the computer.

At 2.8kg, this slimline machine is the most compact and portable in our test and easily fits into one compartment of a small briefcase. In spite of that, it includes an 80GB hard drive and 1GB DDR2 RAM - the competition could learn from HP's example. This is an elegant laptop and, provided you don't need optimum performance, it will serve you well.

VERDICT**PROS**

- Small and light
- Good screen resolution
- Inexpensive

CONS

- Relatively slow CPU

RANGE OF FEATURES**VALUE FOR MONEY****OVERALL**

7

8

7





THIS ISSUE'S WINNER

Alienware MJ-12m

When you can't bear to sacrifice performance away from the office, the MJ-12m is the answer to your needs

DETAILS

PRICE

- £1,849 / \$3,519* / €2,715*
- *Currency converts on
(All prices include VAT)

PLATFORM

Windows

MAIN FEATURES

- 3.4 GHz Pentium 4 processor
- 1GB DDR2 RAM
- 100GB HD
- Nvidia GeForce Go 6800 GPU with 256MB RAM
- 17-inch screen
- 1680x1050 resolution
- DVD-RW & DVD ROM
- WiFi & Ethernet
- 7-in-1 media card port

MANUFACTURER

Alienware

WEBSITE

www.alienware.co.uk



It's get one thing clear from the start - at a little under six kilograms, the MJ-12m is definitely not a laptop. It's portable, but if you had to lug it more than a couple of hundred yards, you'd probably need to visit a chiropractor's afterwards.

Alienware describes it as a mobile desktop, which is to say that it provides an all-in-one solution that can easily be transported from place to place. It's not a machine that you whip out of your bag with a flourish on a crowded commuter train.

However, there are many benefits to such a large, heavy chassis. The most important is the fact that it enables the manufacturer to install a decent processor. This model uses a 'u'-desktop version of the 3.4GHz Pentium 4. This provides at least 10 per cent more performance than the fastest Pentium M processor and, in real terms, probably much more. It lacks the cutting edge power economy and low heat operation of true mobile processors, and that means the computer has very high power consumption, typically lasting about an hour on a full battery. But as we've already pointed out, this is not a machine designed for battery operation - it's meant to enable you to

take your office computer with you anywhere you go.

The other important element is the GPU, and this system uses an Nvidia GoForce Go 6800. Nvidia describes this as an "enthusiast processor" which is to say that it's targeted at serious game players.

Clearly ew high-contrast screen surface too reflective for our tastes, reducing the optimum viewing angle. The review model comes with 1GB of DDR2 memory - we would have preferred 2GB, but this type of fast memory is expensive. Another unique benefit with this system is the fact that it

A TERRIFIC SYSTEM THAT BALANCES PERFORMANCE IN ALL AREAS WITH AFFORDABILITY AND STYLE

rather than 3D professionals. Nevertheless, this doesn't make it bad; it simply lacks the optimisations and certifications that the most demanding professionals may require - but then, if you're that demanding, maybe you shouldn't consider a portable.

The 6800 GPU is second only to Direct3D's Radeon X800 in terms of DirectX performance, even beating the extremely expensive Dell M70. When it comes to OpenGL benchmarks, it's about halfway up the league table, just losing out to ATI's Radeon X600.

With a 17-inch wide-screen display offering a native resolution of 1680x1050, the MJ-12m offers plenty of workspace, although we found the shiny

includes both a DVD-ROM drive and a separate DVD writer, making it useful for multimedia duplication.

The MJ-12m is a terrific system that balances performance in all areas with affordability and style.

VERDICT

PROS

- Inexpensive
- Versatile
- Balanced power

CONS

- Heavy
- Short battery life

RANGE OF FEATURES

10

VALUE FOR MONEY

9

OVERALL

9

SADLY, IF YOU'RE DESPERATE FOR POWER, NO LAPTOP CAN COME CLOSE TO MATCHING THE PERFORMANCE OF A HIGH-END DESKTOP SYSTEM

CONCLUSION | Which portable is right for you?

The scores we awarded were based on a composite of features, rather than any single element. We asked ourselves, "Why would a professional 3D user want a laptop?" Although we came up with many answers, in most situations blistering performance was secondary to functionality - if you're desperate for a powerful computer, no laptop can come close to matching the performance of a state-of-the-art desktop system.

No, we presumed that, for the most part, you require a means to run the same software as in your office, at other locations. You appreciate that there'll inevitably be some performance sacrifices, so you need a machine that provides a working environment that feels as similar to your desktop machine as possible. That means that the machine will need to be versatile, enabling it to meet needs that you envisage.

now, and those that simply arise along the way. Each laptop had something to commend it. Great 3D performance is always a bonus, and it's only relatively recently that portables can offer remotely decent capabilities in this area. However, while great 3D improves the ergonomics of your working environment, raw CPU power has a considerably greater impact, improving the productivity of every task that you perform.

The Dell system, of course, provides blistering 3D performance, but at the cost of CPU performance. However its long battery life is appealing. Is the Surfu machine you'd assemble if money were no object? But of course it is! That brings us to the HP system, at the opposite end of the financial scale. It's wonderfully compact considering its screen size and it's certainly versatile, but it just lacks a bit of oomph in every key performance area.

That leaves the three 17-inch models. We immediately discounted the Sony because it's underpowered, and its OpenGL performance was unstable. Its high-quality high-resolution screen is appealing, however.

The rockdirect system was very tempting, but we felt that too many important economies had been made to meet the price tag.

ooking at the Alienware computer we felt that the company had gone out of its way to anticipate our needs, providing a system that was designed with maximum versatility in mind. It feels as though the MJ 12m is a portable that we can use for just about everything we might want to do, now and in the near future. It's not quite as powerful as a true desktop, and it's certainly bulky, but the MJ 12m will enable you to be productive wherever you find yourself.

PERFORMANCE COMPARISON (HIGHER SCORES BETTER)

Model	Processor	RAM (GB)	SSD (TB)	HDD (TB)	GPU	Power (W)	Display (in)	Weight (kg)	Dimensions (mm)	OS	Price (\$)
HP Compaq NX8220	Intel Celeron	2GB	8GB	1TB	Intel HD 3000	40W	15.6	1.99	350x220x18	Windows 7	2700/3500
Socionext Xtreme TI	AMD Athlon X4 850	8GB	24GB	1TB	NVIDIA GeForce GT 730	45W	15.6	2.2	350x220x18	Windows 10	400/500
Alliedware M-12M	Intel Pentium	8GB	8GB	4TB	Intel HD 4000	52W	15.6	1.98	350x220x18	Windows 10	400/450
Sony VAIO VGN-A397XP	Intel Core i3	10.2GB	8GB	1TB	NVIDIA GeForce GT 730	45W	15.6	2.05	350x220x18	Windows 10	2700/3500
Gigabyte Aivia	Intel Core i5	24GB	64GB	8TB	NVIDIA GeForce GT 730	45W	15.6	2.08	350x220x18	Windows 10	2900/3700

FEATURES

LAPTOP	PROCESSOR	SCREEN SIZE	DISPLAY TYPE	GRAPHICS	COLOURS	MARIO NAME	RAM	DISK	WEIGHT	WARRANTY	KEYBOARD	DISPLAY	PRICE
HP Compaq NX9220	Pentium M processor 750	14 widescreen	600 x 750	A Mobility Radeon X1000	729MB	onyx	1GB	160GB	1.9kg	16 months	80 keys standard	16:9	€ 526 incl. VAT
radionext Xtreme T1	2GHz Pentium 4	17" widescreen	880x 600	AT Mobility Radeon X800	256MB	orange	1.25GB	250GB	2.2kg	2 years	100 keys standard	16:9	€ 1.146 incl. VAT
Alienware M12X	1.4 GHz Pentium 4	17" widescreen	880x 600	Nvidia GeForce 6800	1.554MB	black	1.7GB	160GB	2.4kg	One year return in base	100 keys	16:9	€ 849 incl. VAT
Sony VAIO VGN-A397XP	Pentium M processor 750	17" Biduk	880x 600	AT Mobility Radeon X1000	729MB	black	2GB	250GB	2.4kg	One year return in base	100 keys	16:9	€ 1.012 incl. VAT
Dell M7000	Pentium M processor 750	14 widescreen	920x 600	Nvidia GeForce X1000	256MB	black	1.8GB	160GB	2.2kg	Three year next working day	80 keys standard	16:9	€ 9.06 incl. VAT

**DETAILS****PRICE**

- Full product £411 / \$599 / €599
- Upgrade from Vue 4 Pro £136 / \$199 / €199

PLATFORM
PC / Mac**MINIMUM SYSTEM**

PC

- Windows 2000 / XP
- Pentium III
- 512MB RAM
- 100MB HD
- OS X 10.3
- G4
- 512MB RAM
- 100MB HD

MAIN FEATURES

- Landscape generation and animation
- Includes hundreds of preset scenes and objects
- Supports billions of polygons
- EcoSystems enable automatic generation and conditional distribution of objects
- Many rendering enhancements
- Includes HDR lighting
- Extensive compatibility with third-party 3D programs
- Supports camera synchronisation with the majority of 3D apps
- Render individual channels or save as a G-Buffer
- Support for animated Poser figures
- Advanced procedural material generator
- Easily edit procedural terrains

DEVELOPER
e-on software**WEBSITE**
www.e-onsoftware.com**RELATED PRODUCTS**

- Vue 5 Esprit
Reviewed: issue 59
- Vue 5 Pro Studio
Reviewed: Issue 65

Vue 5 Infinite

Vue may be terrific at creating visualisations and artwork, but can it hack it in the world of advertising and movie making?

BY MAT BROOMFIELD



e-on software now has three channels to its Vue product line. In previous issues, we reviewed Vue 5 Esprit and Vue 5 Pro Studio, to which we can now add Vue 5 Infinite, the 'sequel' to Vue 4 Professional. The most powerful and expensive of the three. It is targeted at anyone involved in architectural visualisation, CG or professional film and video work.

This version introduces a vast swath of new features designed to increase its usefulness as a landscape construction and animation tool. A number of these are technical back end tools, such as import and export filters, greater compatibility with third-party programs, and a greater range of procedural functions. There are also new advanced lighting modes to enable more realistic rendering. However, the feature of greatest interest is EcoSystems.

EcoSystems represents one of the greatest technological advances in 3D that we've seen in many a year. It enables you to comfortably populate your scenes with a vast number of polygons. We're not talking about hundreds of thousands here or even millions, but rather billions of polygons. The most remarkable thing is that you don't pay a massive penalty in terms of the program's responsiveness or rendering time.

EcoSystems is essentially an object duplication and scattering technology. It can replicate thousands of instances of an object and distribute them throughout your



• By using Vue 5 Infinite's EcoSystems functionality to both distribute and colour fields and houses, you can quickly create natural-looking towns and settlements, as in this image

chosen area, applying as much order or randomness as you require. Using simple parameters, it's easy to vary the scale, orientation and colour of the objects to create the impression of even greater variety. Furthermore EcoSystems can comprise multiple objects, so one system may have bushes, grasses and trees.

Each object within EcoSystems can have its own distribution rules, so you might put dense grass on lowlands and assign the colours green, yellow and orange. You could then place shrubs sparsely on mid-elev slopes. Finally, you might place rocks on only

high altitude slopes with an angle of less than 30 degrees. The result is that you can build heavily populated, incredibly diverse and complex conditional environments, without having to manually place each object. Furthermore, as long as you use instances of a relatively small number of master objects, the program runs just as quickly as normal.

The great thing about EcoSystems is that they don't simply apply to plants and rocks. Want to do your own Clone Army? Simple. You just import a single obj with a walk cycle created in Poser and then use



• The new area render can automatically enlarge the selected area so you can check the fine detail, without changing the camera settings



• It's possible to import digital Height maps and apply aerial photos to recreate real scenes, although this isn't one of the program's strengths



• Here's a Z-Buffer and an Alpha channel, but the program can save many more passes, such as highlights, illumination and shadows



• The program automatically assigns a breeze to all plants, although you can still generate directional wind forces to add custom atmospheric detail to your Vue 5 Infinite animations



• The program easily produces impressive photorealistic results at distance, but it still takes a lot of tweaking when you're up close

FroSystems to replicate an army of 5,000 soldiers marching in time. You can even get them to follow a path so they march where you want. By using half a dozen or so separate soldiers, each with their own paths, you can create the appearance of crowd motion. Sadly, the system has yet to allow for proximity or collision detection, but having said that, you can still specify that Eco objects won't be placed so that they intersect other non-Eco objects – so you won't see scattered trees growing out of houses or dogs growling out of a character's head.

for a nanosecond to see why – one sample scene has over 72 billion polygons, so even if you found another program capable of manipulating that many polygons, the scenes would be Terabytes in size.

This means that the emphasis for rendering is placed upon Vue, and it has a whole range of new features and enhancements to assist in this area. In addition to the global radiosity and Global Illumination lighting modes that were added in Vue 5 Esprit, Infinite now offers HDR lighting, where an image is used as a light source for both the global lighting and atmospheres. Furthermore, the program

uses an interface that interacts exactly as he or she requires. This is very much part of the vision to present the program as a professional tool, capable of producing movie grade animation. Now that the Python scripting has been further upgraded, along with the Procedural Editor (to say nothing of the awesome new EcoSystems technology), the program can finally compete with bespoke systems that, in the past, had to be custom written for individual studios.

There are still one or two glaring omissions, the greatest of which is the ability to handle water properly. Vue 5 Infinite can now do a very decent simulation of waves and surface turbulence in the open ocean – but

VUE'S INTERACTION WITH OTHER PROGRAMS PLACES IT IN ITS OWN LEAGUE – IT'S INSPIRATIONAL

advances the rendering optimisations that were pioneered in version 4. These enable lighting modes that were traditionally used for confined, indoor scenes to be used on infinite exterior scenery.

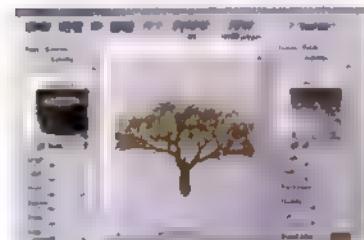
One particularly useful time saver that will primarily benefit animators is Illumination Baking. The illumination is calculated once and stored, and the same calculated metrics can then be applied to every subsequent scene. Illumination Baking is applied on an object-by-object basis and can't be used for plants.

If there's one thing that distinguishes this version of Vue from others, including Vue 5 Esprit, it's the extent to which every single parameter can be tweaked and edited. This is a program that desperately wants to fit into your professional workflow as seamlessly as possible. Therefore each

the water won't interact with objects in any way. Another omission is the current inability to import vector data for overlaying masks and boundaries.

The node-based procedural shader and EcoSystems designer are also obscure and would be complicated for anyone lacking a good understanding of mathematics. Yet for the most part, Vue 5 Infinite makes a very complicated process as simple as possible.

Vue continues to lead where others don't even dream to follow. Its interaction with other programs places it in its own league – it's inspirational and enjoyable to use within itself, you can achieve close-up photorealism and, with some minor reservations, it could be used within the movie industry to create animated landscapes, spacescapes, underwater scenes and much more. •



• Not only can you edit and create your own plants, but they can also be exported for use with other software applications



• Vue 5 Infinite enables you to post-process your images, taking advantage of the program's 96-bit colour registers

IT'S UP TO VUE

The greatest limitation with EcoSystems is that they must be used within the program. You can export every other Vue scene element, including lighting, procedural textures, water animation, atmospheres and more, but EcoSystems can't be exported. In fairness, you only have to think

VERDICT

PROS

- Incredibly versatile
- Quick to get started
- Extensive manual

CONS

- Still no proper water dynamics
- EcoSystems must be rendered within the program

RANGE OF FEATURES

8

VALUE FOR MONEY

9

OVERALL

8

**DETAILS****PRICE**

- Full version £3,000/
\$5,000 / €4,500
- Upgrade from PFmatch
£2,400 / £4,000 / €3,600

PLATFORM

PC / Mac / Linux

MINIMUM SYSTEM

PC

- Windows XP
- 1GHz Pentium
- 512MB RAM

MAC

- Mac OS 10.3.8+
- 750MHz G4
(G5 recommended)
- 512MB RAM

Linux

- Most Linux OSs
- 512MB RAM

MAIN FEATURES

- Fast, powerful 3D tracking
- Supports 3D geometry imports for matching to footage
- Can track multiple objects, in addition to camera, from a single sequence
- Integrated image-modelling functionality
- Automatic Z-depth extraction, provides per-pixel depth data for export as grey map
- Fully editable F-curves with graphical display of camera parameters for re-solves
- Optical Flow analysis and editing offers a per-pixel tracking and camera metadata resource

DEVELOPER

The Pixel Farm Ltd

WEBSITE

www.thepixelfarm.co.uk

RELATED PRODUCTS

- *PFmatch Pro 3.1*
Reviewed, Issue 63
- *hotjar 4*
Reviewed, Issue 64

PFTrack 3

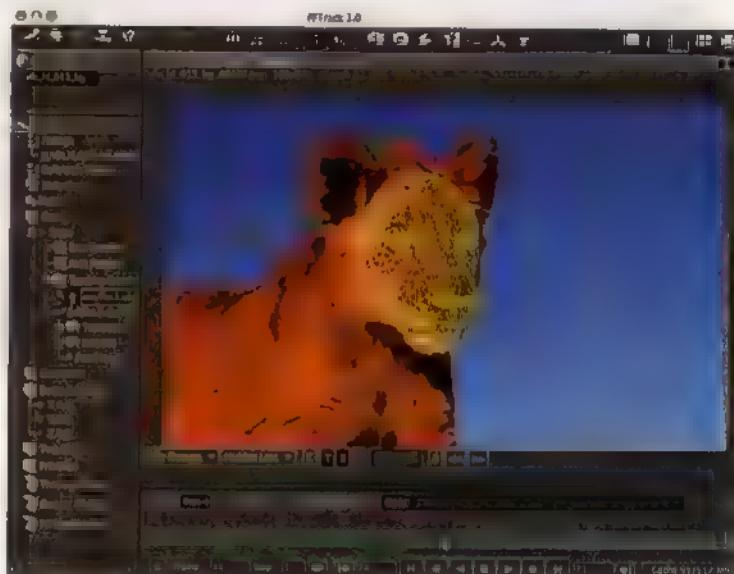
The Pixel Farm has consolidated its position in the camera-tracking market with version 3 of PFTrack – now sporting object tracking

BY MARTIN SOUTHWOOD

formed in 2002, UK-based software developer The Pixel Farm has made great strides in the post-production landscape. Yet while its two previous releases of its core app, the high-end tracking and data analysis product, *PFTrack*, have presented great improvements (such as optical flow analysis), both were marred by the conspicuous lack of an object-tracking facility. Now on version three, *PFTrack* finally sports object tracking, geometry import and model tracking, automatic Z-depth extraction and image-based modelling functions, transforming the application into an even more comprehensive suite of solutions to supplement the high-end tracking core.

Though big, this upgrade remains lean with no gimmicky baggage. Instead, it provides for a greater number of useful routines to be undertaken from within a single application, faster and more easily. This ease of use is an important element of the software's appeal. The Pixel Farm's development ideas originate from people who actually work in the post-production industry – those poor souls who are saddled with the task of fulfilling the ambitious dreams of film directors and producers and who are therefore pushing existing technology to always do that little bit more. *PFTrack 3* will make their jobs easier, and the price has stayed the same, too.

To understand *PFTrack 3*'s new innovations we need to place the software in its proper context. When *PFTrack* was



launched just two years ago, the camera tracking (matchmoving) market was dominated by a handful of products, primarily from pioneer developer 2d3's *Motionographer* and *3D-Equalizer*. From the outset, *PFTrack* had several characteristics to enable it to compete on its own terms, despite its cheaper price. These were a deceptively simple interface, the ability to integrate itself into a working environment through its cross-platform data management system, like a kind of network rendering solution, and the powerful tracking algorithms at its core. Each upgrade has

expanded the practical use of the data generated, which is why version 2 included optical flow technology, capable of per-pixel tracking and data analysis, and advanced motion-capture functions.

INDEPENDENCE DAY

Artists working in 3D and compositing have always wanted something that could track independently moving objects, as well as the camera, from the same shot. This is a solution the main developers have forever been saying was in development. While necessity has provided workarounds, a dedicated object-tracking function has always been both a Holy Grail and a glaring omission from most apps. While Andersson Technologies' *SynthEyes* does allow object tracking, its relative complexity and limited formaton has rendered this an esoteric enthusiast's option.

Last year too, saw industry favourite *3D Equalizer* introduce object tracking with its Point Group feature. But *PFTrack 3* takes this on a stage by including not only object tracking, but also geometry tracking, automatic Z-depth extraction, integrated image-based modelling capabilities and fully editable F-curves. Utilising data obtained



• New Z-depth extraction tools assign depth data, for export as a grey map. *PFTrack* also lets you view a 3D model of this data, and now can further help orientate your scene with a new orthographic viewer option



• *PFTrack 3*'s new geometry import allows a cube matched to the known geometry of a building to facilitate a quick solve. An accurate model of the scene is created, which can then be used to extend a set in perfect scale



• Aided by data from the camera track and a new orthographic view feature, greater accuracy is possible in orientating and quickly building a 3D model of a scene while using native textures from the footage; this proves to be a very useful pre-visualisation facility

from tracking in these ways, and within the application that originally produced the data might seem a logical extension of the technology, yet *PFTrack* and, to an extent, *3D Equalizer* presently stand alone in realising this goal.

AN OBJECT LESSON

Traditional tracking applications require that an object moving independently of the camera within a scene is matted out so as not to distract the algorithms from the principal movement – that of the camera. With *PFTrack* 3, once the camera has been solved, it's now possible to invert the matte exposing only the moving object. This can then be automatically tracked and solved in the usual way – and, in practice, the object is defined as a motion group within the same shot and appears as such in the shot's Overview pane. Your tracked object can then be oriented according to the camera motion in the usual way, though you notice that it appears with a bounding box. This represents the object orientation. By selecting the object group's name, it can then be oriented independently of the camera motion. This is a useful function for tasks such as head or face changes.

The export options also enable you to individually select whichever tracking group you require, and in this latest version can be accompanied by Z-depth data as a grey



• By tiling the viewing windows, the original footage can be visually examined for quality next to its 3D model and subsequent depth gradations as a grey map, as in this example



• It's now possible to quickly build accurately scaled models based on background plates. Easy-to-use tools allow a basic primitive to be deformed to match detail from the plate below

map. This is automatically extracted, though at present only on a frame-by-frame basis, and not as a complete sequence.

PFTrack's unique geometry tracking features are another of those what would be really useful if innovations. If you have a 3D model to match up with live footage, haven't you ever thought how handy it would be if you could just lay it over your footage and match it along with the camera track for the footage, thereby killing two birds with one stone?

PFTrack 3 now enables you to do this, although it doesn't support the import of animated models. Once you've imported your obj file into *PFTrack*, translate, scale and rotate tools help you make an initial match. For especially tricky shots, you can attach a vertex to a pixel in the footage and track and manipulate on a frame-by-frame basis, with each of your changes marked as a keyframe. In addition, if your footage contains some known geometric forms such as buildings, you can import simple geometry, fine-tune the alignment to the object, (by doing) using simple click controls, then use this as the basis for your solve – a method which results in some extremely accurate results.

The new image-based modelling features mean that you are now able to utilise your footage, along with its 3D data, to quickly and accurately create 3D models while using the background plate and its specific 3D characteristics as a guide. This turns your tracking application into a powerful pre-visualisation or animation

planning facility – tasks normally associated with separate standalone applications. Additionally, *PFTrack* now provides a sophisticated toolkit to enable you to reconstruct imported geometry to perfectly match elements within your footage. Using relative resolution, textures can be extracted and mapped to authentically render the finished models.

This upgrade is so substantial that it feels like a totally new application. Even



• After matting out a moving object from the camera track, *PFTrack* 3 enables you to invert the matte and independently track the moving object(s). In this instance a car. Each point group remains independent of the others

PFTRACK 3'S DEGREE OF EXTRA FUNCTIONALITY FEELS NATURAL, LIKE IT SHOULD BE THERE

without mentioning the numerous little enhancements to its interface layout and design, the degree of extra functionality feels natural like it should be there. None of the additional elements give the impression that they've been bolted on in haste instead integrating seamlessly.

Of course it's not perfect – image-buffer compression like that of *3D Equalizer* should be available. Also *PFTrack* 3 still doesn't support the use of reference frames (still images), the Z-depth extraction is limited to a single frame, and as mentioned, the geometry import can't deal with animated models. Finally, it would be a nice luxury to see a quickly rendered movie of the camera track, like those other systems offer. Nonetheless, this is probably the most complete and completely useful film tracking system currently available. •

VERDICT

PROS

- Fast, powerful tracking facility
- Geometry and object tracking
- Automatic Z-depth extraction

CONS

- No animated model imports
- Only partially automated lens distortion correction

RANGE OF FEATURES

9

VALUE FOR MONEY

8

OVERALL

9



3ds max 7.5

Distributed bucket rendering, hair and fur, adaptive radiosity meshing - did Santa forget to drop some stuff off to max subscribers at Christmas?

BY PETE DRAPER

DETAILS

PRICE

- Free to subscription users
- Subscription costs £295 exc. VAT (£440) and must be renewed yearly

PLATFORM

PC

MINIMUM SYSTEM

- Any system capable of running 3ds max 7

MAIN FEATURES

- Hair and Fur
- Use hair as emitters for instanced geometry
- mental ray update
- Adaptive radiosity
- Batch render
- Sweep modifier
- Scene State
- MR Satellite nodes for DBR
- Improved mental ray performance
- Autodesk Revit and Inventor import and file access

DEVELOPER

Autodesk

WEBSITE

www.autodesk.com



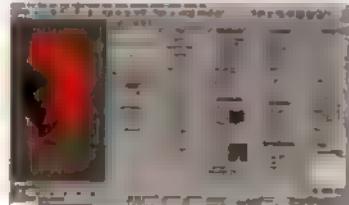
Things have been busy in the Autodesk camp of late, what with rebranding from Discreet to Autodesk Media and Entertainment, and releasing service pack updates and the Cloth extension for 3ds max 7. There's now also an update (of sorts) to the software, in the form of the new 7.5 extension, which is only available to subscription members. This included several improvements to existing tools and some new features that 3ds max users have been crying out for, chief among them Hair and Fur.

Originally based on Joe Alter's Shave And a Haircut plug-in, Hair and Fur can be found in several places in the software including the main object type, where you have complete control over all aspects of the hair strands, clumps, shading, dynamics and so on; and in the Render Effects section, as the hair is by default a post effect, with the shadows being rendered in the initial scanline pass and the hair applied afterwards. Because some renderers don't like post effects, you also have the option to convert the hair to geometry and render it out in one go, but even on the most basic scenes this can seriously crank up the polygon count, resulting in massive render times. The feature set is impressive however particularly the wide range of controls for hair strand/clump shading and distribution.

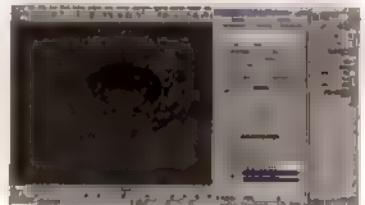
3ds max 7.5 also provides access to Distributed Bucket Rendering (DBR) in mental ray, which enables you to render off a scene on up to eight slave CPUs on additional machines (accessed via an IP address) so the workload can be shared. This helps a lot, but the initial distribution can take a while to prepare, especially if



• The 3ds max 7.5 extension brings access to distributed bucket rendering in mental ray, a godsend when you're working with multiple pass depth of field and motion blur in heavily raytraced scenes



• Although the Hair and Fur interface looks cluttered, it does serve as a central hub for full control over the hair's aesthetics



• Distributed bucket rendering enables you to use up to eight satellite CPUs on the same image, reducing rendering time considerably

you're working on a heavy scene. Even though you have access to eight machines using every available CPU in your medium-sized farm (it's advisable as it can be counter-productive - a single slower machine can make the render hang, and you'll have to wait for that bucket to finish).

The final addition is the inclusion of VIZ extensions, which are more geared to the architectural industry. Radiosity now has Adaptive Subdivision, which saves on scene data and can be more accurate around fine detailed areas. Scene State allows you to set up multiple lighting and camera positions which can then be saved with the main scene (without any heavy additional scene data) - perfect for tweaking lights for different scenarios, moods or lighting conditions. UVW mapping has also been improved to make it more accurate, and there's also the new Sweep modifier, which is simply a cheap version of Loft but which has some nice controls.

While the subscription system seems good value for money (and there's no doubt

it is especially if you buy mid-cycle as you get any updates released during the 12-month cycle at no extra charge), the main flaw is that you have no way of knowing if the extensions are going to be relevant to your area of work. An animator isn't going to have much use for the VIZ extensions, for example. You're also going to be pretty annoyed if you've just gone out and bought *husfjx*. Overall, however, 3ds max 7.5 is a solid upgrade, particularly if you work in the architectural/vizualisation industry. ■

VERDICT

PROS

- Hair and Fur's ability to use instanced geometry
- DBR in mental ray
- Speed improvements with final gathering

CONS

- Hair's interface can be daunting
- Issues with DBR node lists

RANGE OF FEATURES

8

VALUE FOR MONEY

8

OVERALL

8



• Adaptive Subdivision has been introduced to the Radiosity advanced lighting system, reducing the need for meshing an entire object

RELATED PRODUCTS

- *OmniX* 1.1
Reviewed: Issue 64
- 3ds max / Inventor
Reviewed: Issue 59

Surpasses

Work faster and manage your renders better than ever before with this superb new pass manager for LightWave

BY BENJAMIN SMITH



peculiarity of NewTek's *LightWave 3D* is that although the Modeler application has had a neat system of layers built in since the dawn of time, no one has ever had the presence of mind to build a similar system into Layout. In fact, navigating a complex scene remains quite challenging, even in the B.2 release; you have to make some elaborate selections in the Scene Editor to show and hide scene elements in order to make a heavy scene workable.

Enter Lukasz Pazera, plug-in programmer extraordinaire who will be familiar to many LightWave users thanks to his Auto Character Setup system. Pazera has deftly addressed theayers issue, and a host of other Lightwave problems, with the release of Surpasses, a layer manager for Layout that goes far beyond merely being a scene organisation tool; it offers an entirely new way of interacting with LightWave.

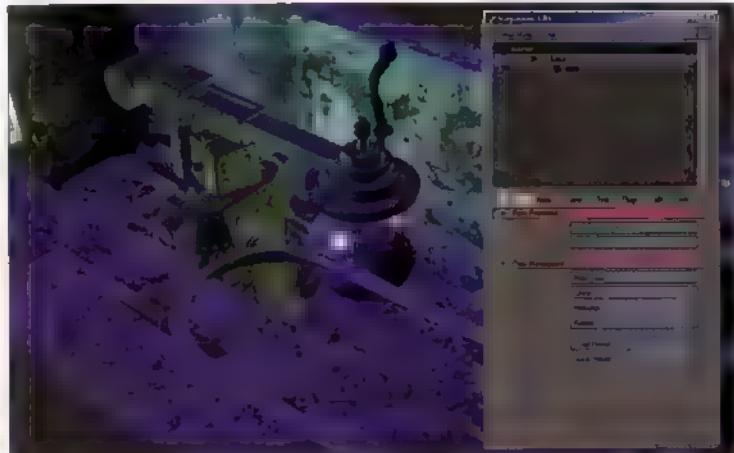
Installing and setting up Surpasses is a little tricky, as though it's all neatly packaged as a single executable that places a host of plug-ins into the appropriate folders in your LightWave install. An LScript then adds them to Layout and creates a neat Surpasses tab. This has a host of buttons, so major functions can be accessed easily.

USING SURPASSES

Adding Surpasses to a scene brings up the main Surpasses panel, from where you can add new passes, place scene elements into them and manage what the passes do. A simple use would be to place different scene elements in different passes so you could easily show and hide parts of the scene, exactly as you would in Modeler.



• Surpasses enables you to instantly switch between modes and views. For instance, you can swap from this Z-buffer render pass...



• Using Surpasses it takes just three seconds to place these robot objects in a separate layer...

However, passes can also give new visibility settings to objects. This means that a complex character rig with lots of objects could be switched from a low-res wireframe with all animation controls visible to an uncluttered, nicely subdivided, smooth shaded display, all with a single click.

Not only that, but settings from Surpasses are renderable as well, so you can hide stuff from renders and give objects different render settings. Now you begin to get a glimpse of Surpasses' secret other life – as a tool for setting up render passes that can be used to drive a composite. Presets are even included, so common settings – such as making an object non-matting black, or forcing the whole scene to use white on black to take a Z-buffer pass – can be applied in moments. You can switch between these settings in an instant and at any time.

Surpasses governs scene properties (fog, render settings, plug-ins) as well, so you could use it to control your scene.



• ...to this handy sketch-like wireframe in an instant. The Surpasses panel also neatly rolls up into a mini-toolbar.



• ...and then you can hide everything else with a single click to remove clutter from the scene

Ignoring LightWave's panels a lot of the time. Pretty soon, you're wondering how you ever managed without it.

There are a few teething troubles with the plug-in however. For instance, some of the fixes NewTek included in LightWave B.2 caused Surpasses to become temporarily broken until Pazera issued an update. However, Surpasses does an amazing job, given the limitations of LightWave's plug-in architecture, and it's likely to become an essential part of any LightWave artist's toolbox. ■

DETAILS

PRICE

- £159* / \$109* / €85
*Currency conversion

PLATFORM

- PC (an OS X version is currently in development)

MINIMUM SYSTEM

- Any system running LightWave 7.5c or higher

MAIN FEATURES

- Layer manager for LightWave
- Effortless layer setup and switching
- Pre-made presets for common settings
- Render pass manager
- Control object and scene settings
- Split scenes into render passes
- Efficient, well-designed UI
- Superb HTML documentation

DEVELOPER

Lukasz Pazera

WEBSITE

<http://sns.polas.net>

VERDICT

PROS

- Boosts productivity
- Simple render pass setup
- Integrates well with FPrime

CONS

- Some teething troubles with LightWave B.2
- Can be tricky to install

RANGE OF FEATURES

9

VALUE FOR MONEY

9

OVERALL

9

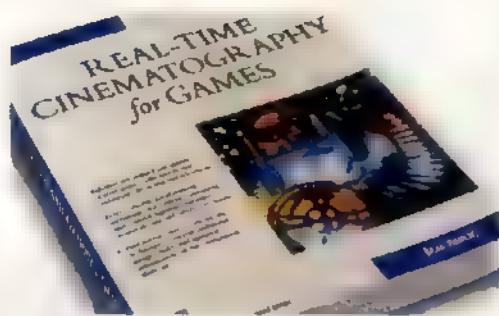
RELATED PRODUCTS

- FPrime

Reviewed: issue 51

DETAILS

AUTHOR
Brian Hawkins
PUBLISHER
Charles River Media
PRICE
£26* / \$50 / €39*
(*Currency conversion)
PAGES
326
ISBN
1 58450 908 4



Real-Time Cinematography for Games

Whenever we cover the topic of 3D and games converging, we find ourselves amazed all over again at the quality of real-time and pre-rendered game art, and with the new generation of consoles we're certain that we'll be blown away on a regular basis by so-called 'cinema-quality' work.

But cinematography – the narrative technique of the cinema – isn't just about detailed textures and powerful lighting. This book seems to be aimed at the game artist looking for a primer in film techniques, and while much of its content is a by-numbers

distillation of the basics of cinematography, the chapters covering the possibilities and limitations of applying cinematic techniques to games are where it delivers genuinely thought-provoking material.

3D artists from all walks of life will find this book interesting, but whether working games artists will find enough in it to justify reading the whole thing is debatable. ●

VERDICT

Useful if you want a basic primer on how film techniques relate to games, but not very practical

7

DETAILS

AUTHOR
Jean Ann Wright
PUBLISHER
Focal Press
PRICE
£17 / \$28 / €25*
(*Currency conversion)
PAGES
344
ISBN
0 240 80549 6



Animation Writing and Development

From Script Development to Pitch runs the subtitle – and this guide certainly covers all aspects of this process, and more.

The book goes far beyond the practical to include historical information and advice for pitching an idea and selling a script, and also takes into account social factors such as children's expectations and different interpretations of animated work. But here's where it falls down slightly: in trying to be so comprehensive, it sometimes strays too far from its subject matter, and instead of remaining tight and lively and delivering

targeted advice, padding begins to creep in: does an aspiring scriptwriter really need a chapter examining the basics of human development, for example, with revelations such as: [Between ages 18 to 45] young adults are establishing new life patterns?

Overall, though, the style is friendly, and there are some genuinely useful chapters, so it's worth a dip if you're starting out. ●

VERDICT

A useful book if you're an animator who's never written a script before

8

DETAILS

AUTHOR
Antony Ward
PUBLISHER
New Riders
PRICE
£40 / \$50 / €59*
(*Currency conversion)
PAGES
793
ISBN
0 7357 1438 X



Game Character Development with Maya

When you first struggle under this book's immense weight you can't help but wonder: has Antony Ward been possessed by the ghost of Leo Tolstoy?

Game Character Development would suggest that he has, at least when it comes to its sheer epic length. And if the book's size is off putting, then its cover image doesn't exactly create a great first impression either; the girl character we're being shown how to model looks more like someone you'd see outside your local bar than inside a fantasy videogame.

At least the information is thorough enough, and you'd need to be a particularly low-watt bulb not to be able to follow the meticulously detailed examples. But at times you feel the book would have benefited from a ruthless pruning and a more judicious use of imagery – do we really need to see a pic of a JOD 5 character that appears as little more than a tiny speck? ●

VERDICT

A good detail-by-detail guide, but not for competent game character designers

9

DETAILS

AUTHOR
Daniel Wade (Ed)
PUBLISHER
Ballistic Publishing
PRICE
£18* / \$34* / €26*
(*Currency conversion)
PAGES
96
ISBN
1 921002 09 3



CG Challenge: Machineflesh

Machineflesh is a product from Ballistic Publishing, the venerable institution that runs the industry's favourite discussion forum, CGTalk. The forum's various themed CG Challenges regularly yield a crop of amateur to professional-level 3D art.

Machineflesh features the best work from one of these contests, and outside of the small group of people whose work is featured you might wonder who it's aimed at. For all its technical skill, the art is pretty lind stuff, and ultimately the Machineflesh concept seems to be the problem. In one of

the book's intros, we find implicit criticism of unimaginative CG ("large-breasted robots with laser eyes, anyone?"), while the winner of the 2D category tells us: "The one thing I wanted to avoid, more than anything else, was the idea of a beautiful girl with wires coming out of her head". So what's on the cover? A large-breasted robot girl with wires coming out of her head. Enough said. ●

VERDICT

Unless blood-smeared robo-dog hybrids are your thing, it's probably best to give it a miss

10

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19TH JUNE 2005

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Buyers' guide

Whether you want advice on choosing a specific software package, or an overview of what's on the market, this database of past 3D World reviews contains the information you need to make the right buying decision

Online Resources



This guide lists prices in Pounds Sterling and US Dollars. For a quick currency conversion: www.xe.com



For non-3D software, our new online portal holds a wide range of reviews: www.3dworldmag.com



hen new 3D users contact the magazine, the most common question they ask is: "Which software package should I buy?" To which the honest response is: "That really depends on you."

Unlike Web design or 2D illustration, there's no single, well-established software package that all professionals use. Instead, choosing a 3D application is largely a matter of personal requirements, not to mention individual taste. Before you begin downloading demos, however, it does help to have a broad overview of what's available – and that's where this buyers' guide comes in.

In this guide, you'll find a list of the key software packages in a particular market sector (the issue of the magazine in which each one featured) and a brief summary of the review. These summaries represent a single reviewer's opinion, but they should give you an idea of the key characteristics of each application.

QUESTIONS, QUESTIONS...

Before diving in, there are two fundamental questions you should ask. Firstly, are you pursuing 3D as a professional career? And secondly, what kind of 3D work do you aim to produce?

If the answer to the first question is 'no', the only limitations on your choice of 3D software are your budget and operating system. In the hands of a skilled user, inexpensive applications can generate impressive results, although they might not do so as quickly as more expensive software (or in a way that professional 3D artists would deem conventional).

If you do aim to make a living in 3D, however, you'd be well advised to pick a 'professional' application, those listed in the upper table on the page opposite. Expensive packages don't necessarily generate better results, but they tend to produce work quickly

flexibly and reliably – all important issues if deadlines are looming. And while studios don't usually hire staff solely on the basis of the software they've used, mastering a name application will familiarise you with high-end tools and increase your chances of freelance work.

Another consideration is whether you intend to produce animations or still images. As a crude generalisation, illustrators and graphic artists often favour pro applications at the lower end of the price scale, while those working in animation, visual effects or game design tend to opt for more expensive packages.

Ultimately, however, there's no substitute for hands-on experience. All major applications have demo versions that you can

CHOOSING APPLICATIONS IS ALL ABOUT PERSONAL REQUIREMENTS AND INDIVIDUAL TASTE

download and experiment with, and before you reject the more expensive packages, remember that many of them – particularly Maya, Houdini, LightWave and Softimage/XSI – have free learning editions. Educational deals also offer students the chance to buy full versions of professional software for the price of a handful of DVDs. To see if you qualify, check the website of the software package you're interested in.

Fortunately, there are very few 'bad' 3D packages on the market so choosing the right one for you ultimately comes down to personal taste. Do your research, consult the magazine, and be prepared to experiment – but above all, enjoy yourself!

ALL-ROUND 3D PACKAGES (UNDER £250)

NAME	RATING	DESCRIPTION	PRICE	WEBSITE	REVIEWER	REVIEW	VERDICT
AIST MOVIE 3D	4	Cut-down version of Reallsoft 3D aimed mainly at home movie makers working in 3D	£149	www.aist2.com	N/A	[Not previously reviewed in 3D World]	N/A
CARRARA 3D BASIC	4.5/5	Performance-oriented 3D studio for small studios, or hobbyists, 3D artists and students	£149	www.ezvia.com	N/A	[Not previously reviewed in 3D World]	N/A
CARRARA 4 STANDARD	4/5	More advanced than the basic version, Carrara 4 has improved rendering and modelling tools	£249	www.ezvia.com	✓	Still a solid purchase for a novice all-round 3D user on a budget. Carrara 4 has improved from earlier versions, but lacks the new rendering tools of the Pro edition.	B
GAMESPACE	3	Programme for creating video games, with some 3D support, using game engines	£149	www.caigard.com	4	Great programme for developing a low-end 3D solution for game and community building. Although it's a bit rough around the edges, an average player on a low budget may still be interested.	7
HASH ANIMATIONMASTER	4.5/5	Programme for 3D modelers, animators and riggers	£149	www.hash.com	7	Powerful, intuitive rigging and animation package, complemented by a simple, versatile renderer. Now adds a complete 3D rigging toolset.	9
PIXELS 3D	3.5/5	Programme for creating 3D models, rigging and tools, including flipbooks and render quality. At very low cost, workflow could be improved.	£49	www.pixeldigital.com	4	Great value for money, and a good programme, though tooling flipbooks and render quality could be improved.	8
REALSOFT 3D 4.0 (FOR LINUX)	4/5	Four-hundred-dollar Linux version of Reallsoft 3D	£149	www.reallsoft.com	8	Excellent render quality for the price, making it ideal for animation work, particularly character animation. Overall, it's highly improved.	9
SHARE 7 DESIGNER LE	4/5	Very inexpensive 3D studio, all aimed at the amateur level, especially popular with hobbyists	£149	www.curiouslabs.com	7	Clearly aimed towards the hobbyist, amateur, this is a good, low-cost solution for 3D object splitting, textures, 3D basic modeling tools and much more.	7
SHARE 7 STANDARD	4.5/5	More advanced than the designer version, Share 7 Standard includes a 3D editor, rendering, animation and much more	£149	www.curiouslabs.com	7	Curious Labs' 3D editor, rendering, animation and much more.	7

ALL-ROUND 3D PACKAGES (OVER £250)

PRODUCT	FORMAT	DESCRIPTION	PRICE	DEVELOPER	WEBSITE	RATING	REVIEW	SCORE
3DS MAX 7	PC	Comprehensive 3D creation, modelling, animation and rendering package. It's the industry standard.	£1,099 £1,299	Digital Creations	www.discreet.com	5.7	A solid, reliable, well-integrated 3D suite featuring modelling, rigging, animation and rendering tools.	9
CINEMA 4D 9 PRO	Mac/PC	Includes a full 3D modeller, motion graphics, rendering and compositing modules.	£419 £479	Maxon	www.maxon.net	5.8	Despite its somewhat dated interface, Cinema 4D is a well-balanced 3D suite.	8
CINEMA 4D 9 BASE	Mac/PC	Unify's never-fail 3D modeller. Additional tools must be purchased as separate modules.	£269 £329	Maxon	www.maxon.net	5.8	A solid 3D modeller with a good range of tools, though it's not as polished as some others.	9
CINEMA 4D 9 PRO	Mac/PC	A powerful 3D modeller that's respected by the choice of many illustrators.	£419 £519	Maxon	www.maxon.net	5.8	This edition isn't specifically reviewed in 3D World, but the Motion and Advanced Render modules are essential for many professionals.	9
CINEMA 4D 9 STUDIO	Mac/PC	Top-level 3D modeller, plus a host of other tools including motion tracking, rendering and compositing.	£249 £299	Maxon	www.maxon.net	5.8	The studio edition adds a powerful motion tracking module, plus a render and compositing module.	9
EAS 3.0	3D/2D	Programmatic 3D and 2D animation package with a focus on rigging.	£459*	Technologic Group	www.technologicgroup.com	5.7	Still an interesting 3D rigging and animation package, but now minus a built-in modeler since the user administer through plain text code.	8
HOUDINI 7 SELECT	Mac/PC	Entrance-level editor, particularly suitable for artists looking to dip their toes in a lower-cost high-end pipeline.	£517 £599	Side Effects Software	www.sidefx.com	5.5	Houdini is a basic 3D tool for artists who want to learn how to rig and animate.	7
HOLIDAY 7 PROSTATION	PC	Programmatic 3D and animation package for skilled artists, with a wealth of features.	£1,119 £1,319	Side Effects Software	www.sidefx.com	5.8	Holiday 7 ProStation contains all the power of previous versions, plus considerable advances in terms of ease of use. Also adds a rendering module.	8
LIGHTWAVE 3D 8.0	Mac/PC	An all-in-one 3D, 2D and compositing package.	£1,299 £1,599	Antares	www.newtek.com	5.8	Lightwave 3D 8.0 retains all the power of previous versions, plus considerable advances in terms of ease of use. Also adds a rendering module.	8
MAYA 6.5 COMPLETE	Mac/PC	Arts-grade high-end toolkit, plus a DVD version.	£1,424 £1,624	Alembic	www.alembic.com	5.8	It might have enormous potential, but Lightwave 3D 8.0 is still a bit of a niche player, does for modeling and the like, but not much else.	7
MAYA 6.5 UNLIMITED	Mac/PC	Provides all the modeling, shading and rendering tools, plus a wealth of tools for non-artistic work.	£1,699 £1,999	Alembic	www.alembic.com	5.8	Maya 6.5 Complete provides all the power of previous versions, plus considerable advances in terms of ease of use. Also adds a rendering module.	7
REALSOFT 3D (FOR PC)	2D/3D	Industrial standard hi-res rendering and 3D modeling application, good for film, TV and games.	£4,999 £5,999	Realsoft	www.realsoft.com	5.8	Realsoft 3D is a rendering and texturing program that's probably one of the most robust available. Still very expensive, but it's definitely the best.	9
SHADE 7 PRO	4.0/PC	Very popular 3D surface shading and rendering application.	£1,299 £1,499	Curious Labs	www.curiouslabs.com	5.8	Shade 7 Pro is a great 3D shading and rendering application.	7
SOFTIMAGE XSI 4 FOUNDATION	Windows	Beginner-friendly, multiplatform 3D tool for 3D artists, leading 3D app for beginners.	£299	Softimage	www.softimage.com	5.8	Fuller featured than Maya, but less advanced than Houdini. Foundation 4 is definitely good for a start, gets a new hobby module for soft surface modeling.	9
SOFTIMAGE XSI 4 ESSENTIALS	Windows	Designed for 3D artists who don't need the full-blown feature set of Foundation.	£199	Softimage	www.softimage.com	5.8	Foundation 4 is a great option for 3D artists who don't need the full-blown feature set of Foundation.	9
SOFTIMAGE XSI 4 ADVANCED	Windows	Designed for 3D artists who need the full feature set of Foundation.	£349	Softimage	www.softimage.com	5.8	Foundation 4 is a great option for 3D artists who need the full feature set of Foundation.	9
STRATA 3D CX	Mac/PC	Convenient 3D drawing, 3D modeling and rendering application, now supported in 2D versions.	£299 £599	Strata	www.strata.com	5.5	Strata 3D CX is a great 3D drawing, 3D modeling and rendering application.	7
TRUESPACE 6.0	PC	Aimed at novices, this is a learning-oriented 3D suite.	£3,499	Ulead	www.uload.com	5.8	TrueSpace 6.0 is a great 3D modeling and rendering application.	8

TALKING POINT | Why use commercial 3D software at all?



IF YOU'RE ON a restricted budget, there is an alternative to the software listed above: an open-source 3D package. The best-known is *Blender*, which is now released under the GNU General Public Licence, along with its companion product, the raytrace renderer *Yafra*. While it would be unrealistic to expect free software to contain all the cutting-edge features of commercial apps,

Blender possesses a standard modern modelling, rigging and animation toolset, is regularly updated, and is supported by an active user community (see www.cgtalk.com). Users may also benefit from its system requirements: it runs on Windows 98, Mac OS 10.2+ or Linux 2.2.5 i386 and only requires a 300MHz CPU and 128MB RAM. www.blender3d.org

TEXTURING

PRODUCT	FORMAT	DESCRIPTION	PRICE	DEVELOPER	WEBSITE	RATING	REVIEW	SCORE
BODYPAINT 3D 2.0	Mac/PC	Programmable 3D painting package, good for artists who want to paint directly on models.	£1,099	Maxon	www.maxon.net	5.7	Not quite as flexible as some other 3D painting tools, but it's a good alternative to them.	9
DEEP PAINT 9.0	PC	Established 3D painting application, regularly updated, and losing relatives to BodyPaint.	£1,299	Right Hemisphere	www.righthemisphere.com	5.8	Requires a lot of RAM storage and processor power, but it's presented in a separate app, which is nice, recently updated, however.	8
PAINT SHOP PRO 8.0	PC	Respected 2D/3D painting application, with 2D/3D painting tools.	£1,099	Corel	www.corel.com	5.7	A solid 2D/3D painting application, with a good range of tools.	9
PHOTOSHOP CS	Mac/PC	The de facto standard for texture lighting applications, for 2D and 3D.	£599	Adobe	www.adobe.com	5.8	While not ideal for professional 3D work, it's a great tool for 2D users if they're not too keen on learning the basics of 3D.	8

MODELLING

Product	Type	Description	Price	Rating	Pros	Cons	Score
AC3D	Mac/Win	Lightweight, multi-platform 3D modeler with a focus on organic modeling.	£24.05* /54.95\$	4.8	Fast, portable, good for organic models.	No A.I., limited export features.	N/A
AMAPI DESIGNER	Win/PL	Long-established modeling package boasting a unique workflow and interface.	£ 379 /279\$	4.5	Extremely fast, great for organic models.	Steeper learning curve, lacks validation.	9
AMAPI 7.5 PRO	Mac/PC	Amapi Designer's new bigger sibling, intended as a serious alternative to older applications.	£ 574 /577\$	4.8	Professional version of Amapi, aimed at industrial modelling. Awesome Dynamic Geometry and better NURBS modeling but workflow validation is tricky.	N/A	9
AMORPHIUM	Win/Mac	Rich-based modeling package very popular with hobbyists, but not necessarily updated.	£ 76* /49\$	4.2	Great for organic modeling, solid tools.	A steep learning curve, lacks validation.	8
FORM-Z 5	Mac/PC	Powerful, long-established all-round modeler used on a wide range of industrial projects.	£ 294* /5.875\$	4.5	Hybrid solid/surface modeler with strong NURBS tools and decent rendering.	This is a premium modeling package - a hybrid solid and surface-modeller with strong NURBS tools and decent rendering. It has a steep learning curve.	8
MOON	Mac/Win	Powerful & streamlined Mac friendly new sub-D modeler created by a team of staff.	£750* /65.95\$	4.8	Relatively new, aiming to be a rounded market vector but currently focusing on modular design, some early stability issues, improving rapidly.	N/A	8
RHINO 6	Win	Another well-established standard 3D modeler, the go-to for many years.	£ 99 /240\$	4.5	Strong NURBS tools and shading modes make this package a strong all-rounder.	New NURBS tools and shading modes make this package a strong all-rounder. Will soon need updating to keep pace with newer competitors, however.	8
SILO	Win	New specialist Sub-D modelling software that's still beta, but improving with many tools.	£ 265* /249\$	4.5	Has transition into a professional app following early stability issues. Highly modular, but could use some UI work.	Only tools and customisability are strong, but needs more polish.	9
ZBRUSH 2	Mac/PC	Powerful, intuitive organic modeling package currently gaining very strong word of mouth.	£ 549* /499\$	4.8	A new interface helps redefine ZBrush as a professional 3D sculpting tool. Still some quirks, but many unique tools and capable of handling millions of polys.	N/A	9

CHARACTER AND FACIAL ANIMATION

Product	Type	Description	Price	Developer	Available	Rating	Review	Score
DAZ STUDIO	Mac/PC	long-awaited new rival to Poser currently still available as a free public beta.	Free	DAZ Productions	www.daz.com	N/A	[Not previously reviewed in 3D World]	N/A
ENDORPHIN 1.0	PC	Innovative motion-synthesis system letting actors to game characters via video.	\$7,995 (\$2,175)	Neurosoft	www.endorphin.com	5.5	Programmatically accomplished and fun to use, it does generate rather an odd world stuntman could actually do, but supports multiple skeletons.	9
FACESTATION 2	PC	Turn video footage of an actor's face into instant animation for 3ds max and Maya.	\$7,450 \$5,995	animator	www.animator.com	5.5	Facial tracking, and can work with real-time capture. Resource hungry however, and the quality of the results is only as good as your morph targets.	8
LIFESTUDIO:HEAD 2.5 PRO EDITOR	PC	Customise a pre-built head model, apply instant lip sync, and export as AVI or as AOV.	\$9,900 (\$5,995*)	Telestream	www.telestream.net	5.5	Great tool, but needs some tweaking & requires a license. It syncs automatically - all you do is track it & export and it'll need doing up.	8
LIFESTUDIO:HEAD 2.5 PRO ARTIST	PC	Create and rig facial models for 3ds max and Maya, then apply instant lip syncing.	\$9,900 (\$7,995*)	Telestream	www.telestream.net	4.5	As the Standard Editor but with the power to import/export directly to Autodesk 3ds max. One of the first proper tools at a kind a time saver for games artists.	8
MESSIAH:ANIMATE 2	PC	Powerful standalone Animation package also available as a plugin for major 3D packages.	\$1,750 \$2,250	messiah	www.messiah.com	5.5	Training manual version 3. A comprehensive tool for animating 3d with very fast rendering times, though it's a bit more expensive now, reduced in price.	8
MESSIAH:STUDIO 2	PC	Messiah:Animates larger parent product adding in full rendering capabilities.	\$1,950	messiah	www.messiah.com	5.5	Not an industry-standard application, and lacks rigging, but is intuitive, fast and powerful. Great rendering, and is capable of some amazing results.	7
MOTIONBUILDER 6 STANDARD	Mac/PC	Innovative motion design software originally developed by Argus, now owned by Alias.	\$8,275 \$5,995	Alias	www.alias.com	4.5	Recommended for 3ds Max. Perfect for FBX rendering, etc. All the playback blues & greens and windows features are organised. Fully rendering, indispensable.	9
MOTIONBUILDER 6 PRO	Mac/PC	Pro motion-editing app, an industry standard for blending mocap and keyframe data.	\$12,245* (\$4,995)	Alias	www.alias.com	6.2	High end tools include mo-cap data editing and data retargeting. It might be a bit expensive, but it's probably the best character animation tool around.	8
POSER 6	Windows	The original figureposing application, now Mac & Linux compatible.	\$145 \$14	3D Studio	www.3d-studio.com	5.5	Performs a few nifty things well-chosen work flow, multi-targets, and a range of new features.	8

RENDERING

Product	Platform	Comments	Version	System Requirements	Performance	Features	Support	Conclusion	Rating
AIR	Windows	Autodesk's complete 3D rendering and compositing software.	E2.2 * CS450	Intel Core 2 Duo 3 GHz 8GB RAM NVIDIA GeForce 8800 GT	Slow	Real-time rendering, compositing, and effects.	N/A	Not previously reviewed in 3D World	N/A
ART-LANTIS 4.5	Windows	Fast software for full rendering, now awaiting its first major update to version 5.0.	4.5.3	Intel Core 2 Duo 3 GHz 4GB RAM	Fast	Real-time rendering.	N/A	This interactive rendering engine is highly versatile and provides decent render quality without fine-tine control, though it's recently updated.	7
BRAZIL R/S	HL	Powerful software renderer used in both stills and effects work, soon to be ported to Maya.	4.1	Intel Core 2 Duo 3 GHz 4GB RAM	Medium	Real-time rendering.	N/A	R/S and robust, with an excellent shader system, delivering high-quality results.	9
FINALRENDER STAGE-1	Windows	Another powerful 3ds max renderer often used in visual and visualization work.	F1R 1.0 CS795	Intel Core 2 Duo 3 GHz 4GB RAM	Slow	Real-time rendering.	N/A	Powerful, new Hybrid rendering engine. It's fast but additional results require a lot of tweaking. Some instabilities, particularly in distributed renders.	7
MENTAL RAY 3	Windows Linux	A built-in renderer in 3ds max, Maya and XSI, usually used for stills or short-form work.	3.1.0 for use	Intel Core 2 Duo 3 GHz 4GB RAM	Medium	mental images	N/A	Not previously reviewed in 3D World	N/A
POV-RAY	Mac/PC Linux	Extremely popular free-to-use renderer capable of very top quality results.	3.6	Intel Core 2 Duo 3 GHz 4GB RAM	Fast	Ray tracing	N/A	No direct review in 3D World	N/A
RENDERMAN 12	Mac/PC	Pixar's rendering workhorse for production pipelines, the standard for film effects work.	R12.1 CS5.6	Intel Core 2 Duo 3 GHz 4GB RAM	Medium	renderman 2008 API	N/A	Evaluates at version 11. Fast, efficient memory usage and a well-documented shader language. Now incorporates GI rendering tools and selective ray casting.	N/A
TURBLE	Mac/PC Linux	Third-party Maya renderer designed in after a few updates to succeed in image quality.	2.0.1 CS5.3	Intel Core 2 Duo 3 GHz 4GB RAM	Fast	Real-time rendering.	N/A	Extremely fast raytrace rendering. Currently oriented to architectural work due to lack of support for materials and Phong E-Merts, but developing rapidly.	7
V-RAY	PC	Lower-priced rival to Brazil, a third-party 3ds max renderer for stills and effects.	1.2 CS5.0	Intel Core 2 Duo 3 GHz 4GB RAM	Chaos	Real-time rendering.	N/A	Not previously reviewed in 3D World	N/A

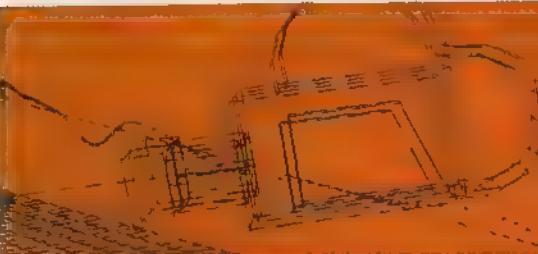
COMPOSITING AND EFFECTS

PRODUCER	FORMAT	DESCRIPTION	PRICE	VERSION	WEBSITE	CONTACT	PRICE	VERSION	WEBSITE	CONTACT	PRICE	VERSION	WEBSITE	CONTACT	SCORE
AFTER EFFECTS 5.5 STANDARD	Mac/PC	Up to 10% faster than CS3, up to 50% faster than CS4. 3D support.	£199	£199	Adobe	www.adobe.com	£17	Updated video timing features, plus the addition of Photoshop's Liquify tool make for a major upgrade. Still the same cluttered old interface, however.	www.adobe.com	Adobe	£199	CS5	www.adobe.com	Adobe	B
AFTER EFFECTS 5.5 PROFESSIONAL	Mac/PC	All After Effects Standard features plus high-end tools worth investing in for professional work.	£915	£915	Adobe	www.adobe.com	£17	Motion tracking enhanced keying and masking, panini systems and 3D hit testing tools. Make this a better option than AE Standard for serious 3D work.	www.adobe.com	Adobe	£915	CS5	www.adobe.com	Adobe	B
COMBUSTION 4	Mac/PC	Updated CS4-style UI. TECNISCOPE.	£199	£199	Discreet	www.discreet.com	£15	Very strong UI. Does well organised workflow and good compatibility with CompuCam.	www.compcam.com	CompuCam	£15	CS5	www.compcam.com	CompuCam	9
DFX+4	PC	Cut-down, modular version of Digital Fusion much beloved of PC-based VFX workflows.	£199	£199	Discreet	www.discreet.com	£13	Most of the improvements in version 4 are aesthetic, but still a powerful affordable node-based compositing app. Good visual effects and 3D tools.	www.dfxplus.com	Dfx+4	£199	CS5	www.dfxplus.com	Dfx+4	B
DIGITAL FUSION 4	PC	Introducing digital effects and compositing packages in full HD quality.	£199	£199	Discreet	www.discreet.com	£13	New in CS5. A lot more useful, unlike Dfx+4 making this a powerful - and expensive - reason to move away from After Effects and to film-quality work.	www.digitalfusion.com	Digital Fusion	£199	CS5	www.digitalfusion.com	Digital Fusion	B
MOTION	Mac	Entry-level motion graphics package suitable for simple graphics, titling and effects.	£199	£199	Apple	www.apple.com	£6	Good masking and particle tools, but nothing like a full-blown version of After Effects. Few training & free trials, though, and the interface can be sluggish.	www.motion.com	Motion	£6	CS5	www.motion.com	Motion	B
SHANE 3.0	Mac/Linux	Powerful node-based deal with visual effects and motion graphics.	£199	£199	Apple	www.apple.com	£4	The most down-to-earth 3D application on the market, with the possible exception of Toon Boom Animation's 3.5, but its unswayed morphing tools.	www.shane.com	Shane	£4	CS5	www.shane.com	Shane	B

CAMERA TRACKING AND MATCH MOVING

PRODUCER	FORMAT	DESCRIPTION	PRICE	VERSION	WEBSITE	CONTACT	PRICE	VERSION	WEBSITE	CONTACT	PRICE	VERSION	WEBSITE	CONTACT	SCORE
3D-EQUALIZER 3.0	Mac/PC	Venerable (and Oscar-winning) auto-3D package still widely used in film.	£299	£299	www.vision	www.vision.com	N/A	(Not previously reviewed in 3D World)	www.vision.com	vision	N/A	3D EQUALIZER 3.0	www.vision.com	vision	N/A
BOJOU 3.0	Mac/PC	One of the best major alternatives to 3D Equalizer popular in the effects world.	£1,099	£1,099	Bojou	www.bojou.com	£16	Version 3 is a powerful tracking package, but this much heavier and slightly less polished update may prove a difficult investment to long-term Bojou users.	www.bojou.com	Bojou	£16	BOJOU 3.0	www.bojou.com	Bojou	6
BOJOU REALTIME	Mac/PC	Bojou's desktop version, but intended for smaller post facilities.	£1,099	£1,099	Bojou	www.bojou.com	£14	Aimed at smaller post facilities, but has good basic 2D and 3D tracking, plus any resolution advantage that can prove invaluable with zoom shots.	www.bojou.com	Bojou	£14	BOJOU REALTIME	www.bojou.com	Bojou	7
MATCHMOVIE PRO 3.1	Mac/PC	Another of the old guard of desktop trackers, despite being heavily reduced greatly in price.	£799	£799	Bojou	www.bojou.com	£3	A highly evolved version of the software with powerful 2D and 3D tracking tools, no optical flow facility, however, and a £10 module costs an extra £10 extra.	www.matchmovie.com	MatchMovie	£3	MATCHMOVIE PRO 3.1	www.matchmovie.com	MatchMovie	7
PYRHO	Mac/PC	A powerful low-cost 2D and 3D tracking system named by JL Wiegert, now owned by Bojou.	£399	£399	Bojou	www.vision.com	£2	Fast and robust 2D and 3D tracking, with great value for money and ideal for a target audience of aspiring digital filmmakers and independent filmmakers.	www.pyrho.com	Pyrho	£2	PYRHO	www.pyrho.com	Pyrho	9
PFTACK 3	Mac/PC	PFTack's popular sibling offering a useful range of tracking tools at a sensible price.	£399	£399	PFTack	www.pftack.com	£7	Great value, although its broadcast-resolution footfall in AVI and QT formats is supported. Good user interface, version 3.0 adds pro-resolution tracking.	www.pftack.com	PFTack	£7	PFTACK 3	www.pftack.com	PFTack	8
PFTACK 3.2	Mac/PC	First of a new generation of lower priced tracking tools. AVI and QT formats supported.	£399	£399	PFTack	www.pftack.com	£7	Fast and robust 2D and 3D tracking, with powerful optical flow and analysis tools. Affordable although recently undercut in price by MatchMovie Pro.	www.pftack.com	PFTack	£7	PFTACK 3.2	www.pftack.com	PFTack	9
SYNTHESYS	Mac/PC	An increasingly affordable new all-round kit.	£1,099	£1,099	Synthesys	www.synthesys.com	£10	An incredible range of tools for film and DOPs, outperforms costlier rivals on many counts.	www.synthesys.com	Synthesys	£10	SYNTHESYS	www.synthesys.com	Synthesys	9

TALKING POINT | Where next for camera tracking?

 SINCE THE TURN of the decade, studios have been turning to specialist camera tracking packages to integrate CG elements with source footage. Although 2D and 3D tracking have been possible for years, true object

tracking has only just become available in commercial software, most recently in PFTack 3. Technical revolution or evolution? Find out in our reviews section this issue. PFTack 3 is reviewed on page 92

LANDSCAPE GENERATION

PRODUCER	FORMAT	DESCRIPTION	PRICE	VERSION	WEBSITE	CONTACT	PRICE	VERSION	WEBSITE	CONTACT	PRICE	VERSION	WEBSITE	CONTACT	SCORE
BRYCE 5	Mac/PC	The original landscape generator - now back in development after a 4-year absence.	£299	£299	D&L Productions	www.dl-productions.com	£6	Still 2D, used as a toy for hobbyists. Bryce is easy to use and renders at very good speed for photorealistic backgrounds, even with a slow renderer.	www.dl-productions.com	D&L Productions	£6	BRYCE 5	www.dl-productions.com	D&L Productions	8
MOJOMWORLD 3	Mac/PC	Unusually fast 3D landscape generator with a unique emphasis on creating entire planets.	£1,099	£1,099	Discreet	www.discreet.com	£5	A unique approach to landscape generation that will take users from great 100% heightmaps to detailed terrain that's hard to compute the details and the interface can be frustrating.	www.mojomworld.com	MojomWorld	£5	MOJOMWORLD 3	www.mojomworld.com	MojomWorld	6
VUE 5 ESPRESSO	Mac/PC	Vue's Vue 5 Expresso - a market-leading high-quality 3D rendering system.	£1,199	£1,199	E-Software	www.e-software.com	£59	Rigged to rules, seeing landscapes generated very quickly. Good interface to use. New version 5 is slow, however, and the interface is dated.	www.vue.com	Vue	£59	VUE 5 ESPRESSO	www.vue.com	Vue	9
VUE 5 PRO STUDIO	Mac/PC	The Vue 5 Expresso is augmented by four add-on modules and a purchase separately.	£2,749	£2,749	E-Software	www.e-software.com	£6	A well-rounded outfit of add-ons. Although some features should arguably lie in the core app, Movie, Poser import, and Bryce (plant editing), are of real value.	www.vue.com	Vue	£6	VUE 5 PRO STUDIO	www.vue.com	Vue	8
WORLD CONSTRUCTION SET 6	Mac/PC	World Construction Set 6 - a very useful 3D landscape generator.	£1,299	£1,299	3D Nature	www.3dnature.com	£12	Revised version 6.0. A versatile program that generates very realistic landscapes in a short time. As yet, a very basic feature set, but it's improving rapidly.	www.3dnature.com	3D Nature	£12	WORLD CONSTRUCTION SET 6	www.3dnature.com	3D Nature	8
WORLDBUILDER GENESIS	PC	A popular alternative to the WorldBuilder 3D, more powerful than Bryce but technically less.	£209	£209	Digital Element	www.digitalelement.com	£2	Beautiful and realistic, and fairly easy to use. Now very much optimised for 3D max, though, while some of the new features are yet to be fully implemented.	www.digitalelement.com	Digital Element	£2	WORLDBUILDER GENESIS	www.digitalelement.com	Digital Element	7
WORLDBUILDER PRO 4	PC	Highly advanced 3D world generator.	£299	£299	Digital Element	www.digitalelement.com	£7	A terrific program with many unique features, particularly for plant and water animation, and great user control over fine detail. But see reservations above.	www.digitalelement.com	Digital Element	£7	WORLDBUILDER PRO 4	www.digitalelement.com	Digital Element	7

WEB 3D AND MULTIMEDIA

PRODUCT	FORMAT	DESCRIPTION	PRICE	DEVELOPED BY	MAINTAINED	VERSION	VERDICT
ANARK STUDIO 3.0	3D	Established authoring package for interactive 3D web 3D.	£199	Anark	www.anark.com	5.0	A powerful solution for large-scale real-time 3D, but the new higher price and absence of Mac support will leave some existing users high and dry.
AXELRAGE 2.0	Multiformat	All-in-one authoring and editing multimedia package designed to exploit 3D web 3D.	£1995	AXELRAGE	www.axelrage.com	5.0	Useful addition to the growing 3D tools market, although animation and interacting tools, export and import options may have improved since version 1.0.
CULT3D	None	Free software suite for exporting 3ds max and Maya models in interactive online format.	Free	YUPO	www.yupo.com	5.0	Reviewed using the 3ds max exporter] Relatively straightforward to use, with a good range of options in the exporter. Very much more stable in recent builds.
DIRECTOR MX 2004	2D/3D	Design tool for creating interactive 3D web 3D. Includes 3D rendering, sample 3D tools.	£199	Macromedia	www.macromedia.com	5.0	Fairly advanced 3D tool, but few new 3D tools with a version 4. However, it has a wide range of useful built-in tools, but no programming needed to interface to 3D.
QUEUED 2.1 ENTERPRISE	3D	Real-time 3D authoring tool, also available in Director 8.0 and Director 8.5.	£199	Queued	www.queued.com	4.5	Full-featured all-round authoring app, but fairly easy to master no programming required. Can become unmanageably cluttered on complex projects, though.
SWIFT 3D 4	3D	3D authoring software, now part of the director family. Updated interactive 3D tools.	£199	Swift 3D	www.swift3d.com	5.0	No major changes, just significant stability improvements. The 3D tools still remain a bit clunky, though.
WIREFUSION 4 ENTERPRISE	3D	Visual authoring tool for interactive 3D content. Also available in Director editions.	£995	Director	www.wirefusion.com	5.0	Excellent 3D authoring tool, no need for programming at all. It's extremely user-friendly and quick to master.

OTHER TOOLS

PRODUCT	FORMAT	DESCRIPTION	PRICE	DEVELOPED BY	MAINTAINED	VERSION	VERDICT
3D SCAPE	MC	Image-based modelling software, one of the newer, less expensive additions to the market.	£349	Software Simulation Software	www.ssc.com	4.5	Good alternative against a market dominated by ZBrush and Modo, though not as feature-rich as the others.
D JOINER	3D	Photo stitching software, less widely known than ZJoiner, but suitable for hobbyists.	£390 (S\$575)	Pixelmator	www.pixelmator.com	5.0	It does what it says on the tin, with its main selling point being a clean interface & clear usability, although it's disappointingly slow to boot.
D SCULPTOR 2.0 STANDARD	3D	Image-based modelling software, another mid-priced package aimed at hobbyists.	£349	D-Sculptor	www.d-sculptor.com	5.0	Reviewed at version 1.0] A good tool for creating 3D models from images, and cheaper than ZBrush or Modo. Much slower and not as powerful, however.
DEEP EXPLORATION 3.5	File conversion	File conversion software capable of handling a wide range of file formats, including 3D.	£779 (S\$1199)	Pixelmator	www.pixelmator.com	4.5	With a straightforward interface and a range of useful tools, it's a decent alternative to the likes of 3D Studio Max's editing tools, incidentally, and offers a great output.
FRAMEPIPE 3D STUDIO	3D	Stringboarding software and the new wave of apps aimed at previs & storyboarding.	£199	Framepipe Software	www.framepipe.com	5.0	Extremely easy to use, and scales to even low-budget movies. Specialised props only available as add-on packs, though simple scenes can be sluggish.
IMAGEMODULER 4.0	3D	Image-based modelling software one of the earliest dedicated photogrammetry packages.	£799 (S\$1199)	Modo	www.modo3d.com	5.0	Good performance quality for its age, and an excellent tool for creating 3D objects, but requires a dedicated user input, which also comes at a price.
IMODULER 3D 2.0 WEB	3D	Image-based modelling software creates 3D objects from image use in Java-based browser.	£219	Modo	www.modo3d.com	5.0	Extremely fast and robust, though with the release of version 3.0, it's probably not the best choice for those who still use Java.
IMODULER 3D 2.0 PRO	3D	Image-based modelling software for professional 3D artists, exporting to a range of 3D file formats.	£1499 (S\$2199)	Modo	www.modo3d.com	5.0	Impressive and strong indeed, though it's not yet 3D aware if that's the thing. It's also likely to be targeted towards professionals, which is a bit of a pity.
NUKONAP 4.0	File conversion	File conversion software powered with GPU support for 3D file formats.	£199	Nukonap	www.nukonap.com	5.0	A solid, reliable package overall, it's a demanding task to convert complex files, though, and the user interface is a tad dated.
PARTICLEILLUSION 3	3D	Particle software generated 3D effects in real time, but used for architectural projects.	£799 (S\$1199)	Pixelmator	www.pixelmator.com	5.0	A 3D particle alternative to Renderosity's 3D, we've found, and for architectural production purposes, would be a reasonable choice with its features and user control.
POLYTRANS 4.0	3D	File conversion software for 3D file formats.	£249	Pixelmator	www.pixelmator.com	5.0	Reviewed at version 1.0] Not your everyday 3D converter, though, so it's something that 3D artists should consider. Converts most common file formats.
REALFLAME 2.0	3D	Fluid simulation software, the market leader for realistic fluid design & simulation.	£499 (S\$749)	Pixelmator	www.pixelmator.com	5.0	Good for the price, though it's not as powerful as some alternatives, such as Fluidsim.
STITCHER 4.0	3D	Image stitching software that stitches multiple images into a single scene.	£199	Pixelmator	www.pixelmator.com	5.0	Incredibly powerful and versatile. Not a quick solution, though, but it's up there in competition in terms of results, although that's not surprising given the price.
STORYPIPE	3D	Project management software for 3D artists.	£1995	Pixelmator	www.pixelmator.com	5.0	For more flexibility and open-ended project management, this is the way to go. Storypipe offers some included templates, though, and you can always import your own.

CONTACT US | Have we missed anything?

THINGS CAN CHANGE very quickly in the world of 3D software. If you've spotted an error in this buyer's guide, please contact us at the email address below. However, before writing in, please bear the following points in mind:

1. All prices exclude VAT and shipping, plus any optional extra costs, such as printed manuals or maintenance contracts.
2. Asterisks denote currency conversions from a list price at the current rate of exchange when the entry was added to the buyer's guide.

3. Due to limitations of space, not all sectors of the 3D market can be covered each issue. We aim to vary our listings from month to month.

4. Space also precludes us from listing the thousands of plug-ins currently available.

5. The verdict column contains a synopsis of our last published review. In most cases this will refer to the current version of the software. Where this is not so, it should be clearly noted.

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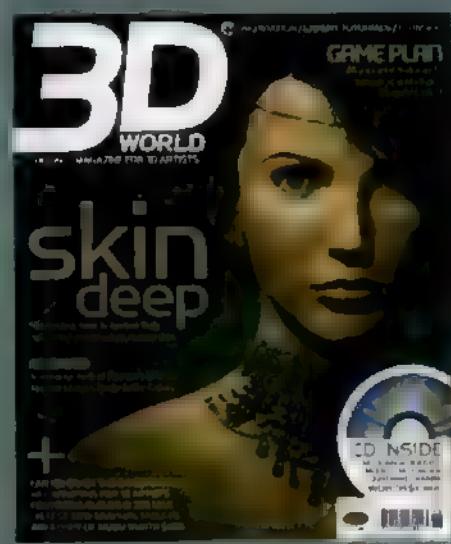


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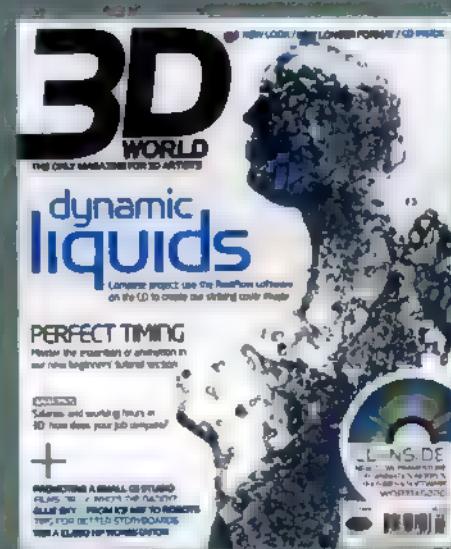


ISSUE 65

SKIN DEEP

June 2005

Texture truly convincing photoreal skin. A guide to *The Hitchhiker's Guide to the Galaxy*. Survive as a next-gen 3D games artist. **ON THE DISC**: *MayaBuilder 6 PLF*, models, mo-cap and LightWave training worth \$1,800



ISSUE 64

DYNAMIC LIQUIDS

May 2005

Recreate our cover image in RealFlow behind the scenes on Robots; typical salaries and working hours in 3D - exclusive survey. **ON THE DISC**: *RealFlow 4 [demo]*, plus Framestore CFC animations, models, textures and software worth \$220



ISSUE 63 THE BRITS

ARE COMING

April 2005

ON THE DISC

Mimic 2, models and facial mo-cap data worth \$1,100



ISSUE 62 DREAM MACHINE

March 2005

ON THE DISC

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studio profile

Useful information for 3D artists seeking work at visual effects companies.
This issue: **CafeFX**



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- *The Aviator* (2004)
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- *The Terminal* (2004)
- *League of Extraordinary Gentlemen* (2003)
- *Master and Commander: The Far Side of the World* (2003)
- *Gothika* (2003)
- *Spy Kids 3-D: Game Over* (2003)
- *Spy Kids 2: Island of Lost Dreams* (2002)
- *Panic Room* (2002)

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URL
www.cafefx.com

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TYPICAL NUMBER OF FREELANCERS
30

TYPICAL NUMBER OF FULL-TIME RECRUITS PER YEAR
10

LOOKING FOR USERS OF WHICH 3D SOFTWARE?

- Maya
- LightWave

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- Character animators
- Texturing artists
- Lighting artists
- Matchmoving artists
- 3D generalists

DESIRABLE SKILLS FOR EMPLOYEES
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Posters	1 - A0 full colour 1 side on 170gsm	£300

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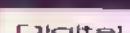
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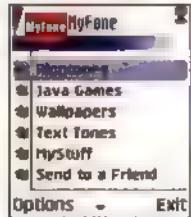
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BUSINESS END

Each issue, our panel of experts answers the legal and financial questions of freelancers and small studios. This month, we ask...

"Can I use their logos?"

Q I'm producing a football-related game, and I'm quite never produced a sports game before, and I'd like to know whether I can safely use the logos of the clubs that are featured, and the names and images of players, or whether I should be getting some sort of consent? **MAX MACHINERSON**

This is something of a legal minefield, so bear with us! Club logos and the images and names of players are usually protected, and the first thing you should consider is the jurisdiction(s) in which your game will be available. You should take specific local advice in any territory in which you're seeking to release the game, or plan to make the game available for downloading from the Internet. As usual, the advice in this column is based on English law.

You'll need to identify which of the above elements you'll be using in your game, and therefore which ones you may need to clear. Certain team names, logos and crests may be registered as trademarks. While you can carry out searches in respect of such ownership at the trademark registries of the jurisdictions where you intend to market/sell the game, it can be prohibitively expensive to carry these out, especially if you're intending to market the game in a number of territories.

In the event that you don't obtain consent to such use, even if a team name has been registered as a trademark for games, it may still be possible to use the name in the game itself, on the basis that you're using the mark merely to identify a team or teams, rather than in a way that endorses your game.

THE RIGHTS STUFF

However, if the club name and/or logo is protected as a copyright work, and it's copied or reproduced in your game, the club could bring an action for copyright infringement against you. If the club's logo is fairly new, the club may also have the right to bring a claim for registered and/or unregistered design-right infringement against you based on UK or EU design rights. The biggest risk you face is being accused of 'passing off', if there's the suggestion of a link between your game and the team(s).

The laws of a number of countries (including certain states in the US) provide for specific personality or image rights, but English law doesn't provide any such right. Check if a player's name has been registered as a trademark; the same considerations as for registered team names will apply as set out above.

Even in the absence of a trademark registration, you'll still need to take care that the player won't be entitled to bring an

action for passing off or false endorsement. A claim for passing off could be brought if there's a likelihood that a person using the game will believe that the particular player has endorsed or approved the game in some way. Formula One driver Eddie Irvine brought a successful High Court action against Talksport Radio for the use of his image without prior permission. Irvine was able to show that such use amounted to a false endorsement of the station under the law of passing off. Initially, the court awarded Irvine nominal damages of £2,000, which was later increased to £25,000 when he was able to show that this amount was typically what he was able to charge at the relevant time for legitimate similar endorsement work. But it may be more difficult for any one player to bring a passing off claim if a number of players' names are used in the game, and provided that the names are not used on packaging or in advertising.

If the exact strip of a particular club is used in the game then this may amount to an infringement of the club's copyright or design right in the strip (which may be protected as an artistic work). There's also the risk here of a passing off claim, as colours are indicative of teams and therefore may imply that a club, or the league as a whole, endorses your game. In these circumstances, it's less likely that a claimant would succeed in an action against you for passing off, although it doesn't mean that they won't launch a claim against you.

In terms of damages, if a successful claim is made against you a court could calculate damages based on an account of profits (which is just one way in which loss is calculated); therefore, the more games you sell, the more you'll have to pay. The court can also award damages based on the value of a typical licence between you and the club.

But don't be disheartened. In the past, the English Football Association has been prevented from bringing an action for trademark infringement for use of its marks in what appears to be an incidental fashion, on the basis that such use did not amount to use of the trademark, and therefore no infringement could occur.

Above all, you really ought to clear all the rights in your game, even if you think it's something insignificant.

Lucy Adler and Lee Cage are solicitors at the Intellectual Property Group dealing with all aspects of protection and exploitation of client's rights in relation to traditional and new media. (w) www.harbottle.com

● OTHER RESOURCES

www.patent.gov.uk
The UK Patent Office

www.uspto.gov
The US Patent Office

www.ehuropa.int/en
European site for The Office of Harmonisation of the Internal Market

www.premierleague.com
The official website of the Premier League

www.spiraltechnology.com/page_0015.htm
More about image rights and the Eddie Irvine case

THE BIGGEST RISK IS BEING ACCUSED OF PASSING OFF

IMPORTANT NOTE:
This article is written in general terms, and is not legal advice. Before taking any action on the basis of its contents you should take specific legal advice. Neither 3D World nor Harbottle and Lewis LLP will be responsible for the results of your acts or omissions that are made on the strength of this article.

Making The Mantis Parable Part One

Cyan's Josh Staub chronicles the highs and lows of creating an independent animated short, and assesses what lessons his experiences hold for others



MOST ANIMATORS DREAM of making their own movies. But how do you go about turning that dream into a reality? Over the course of this four-part production diary I'll attempt to demystify the process of making and marketing an animated short, based on my experiences with my own eight-minute film, *The Mantis Parable*.

De-Myst-ifying is actually a pretty good word to use because by day, I'm the Art and Visual Design Director for Cyan worlds creators of the computer games *Myst*, *Riven*, and *Uru*. But I've always wanted to learn the art of story telling in a linear medium, and so in 2003 I set out to create my own animated short. What follows are the highs and lows of that two-year solo late-night do-it-yourself adventure in linear storytelling: an adventure that would cost close to \$4,000 of my own money, occupy countless hours of my free time, but would eventually culminate in *The Mantis Parable* being screened at film festivals around the world.

SLASH DOT COM

Having a website (www.themantisparable.com) for an independent short serves several purposes. Firstly, it's a great way

to track your progress. Since the early summer of 2003, we kept a production journal on the site (which records the obstacles we faced) and a 'Making of Mantis' section, documenting specific texturing, modeling, and lighting techniques.

But the website's greatest feature is that it provides an interface with fans of the film, yielding a constant stream of much-needed encouragement. Discovering that you have an audience is an amazing source of motivation; in a sense, you're no longer making the film for yourself, but for everyone awaiting its completion. The realization that other people had very high expectations for *The Mantis Parable* kept me pushing to do my very best during the late nights when I would have much preferred to just go to bed.

The film is about the relationship between a caterpillar who's trapped in a jar, and a praying mantis who somehow knew clearly what he wanted the story to be about before

THE HIGHS AND LOWS OF A TWO-YEAR, SPARE-TIME, LATE-NIGHT, D.I.Y ADVENTURE

I had the characters in mind, and I tried to keep it as simple as possible – something I continuously reminded myself of throughout production. I realised that as I worked on it, *The Mantis Parable* was going to grow in strange and unpredictable ways, so the simpler the foundation, the more likely I was to complete it. In fact, as my early test renderings reveal, the original plan for the setting of the film was simply the glass jar on a blue Jack-o-lantern.

After a couple of weeks trying out different ideas, I fully had my 'script' – which, given that there's no dialogue in the film, was actually more of an outline. Next came the storyboard, which began by scribbling up a sequence of shots for Act I while on an airplane on my way home from a business trip. Storyboarding was a new experience for me, and as such, it was really an exercise in trial and error. I did my best to fully board out the first act, knowing that when I actually began working on the film, I'd find my storyboards far from perfect. As it turned out, by the time I had completed Act I, I had more than doubled the number of shots my storyboard said would be required. An exclusive clip from the film accompanied by an overview of that initial storyboard is available on this issue's CD.

PRODUCTION COSTS TO DATE

SOFTWARE

(Bought unregistered online)

- 3ds max 4.2
\$325
- Photoshop 7.0
\$350
- After Effects 5.5 PB
\$285
- Illustrator 10
\$100
- Dreamweaver MX 2004
\$210
- Sorenson Squeeze
Compression Suite, V-Ray
Free

HARDWARE

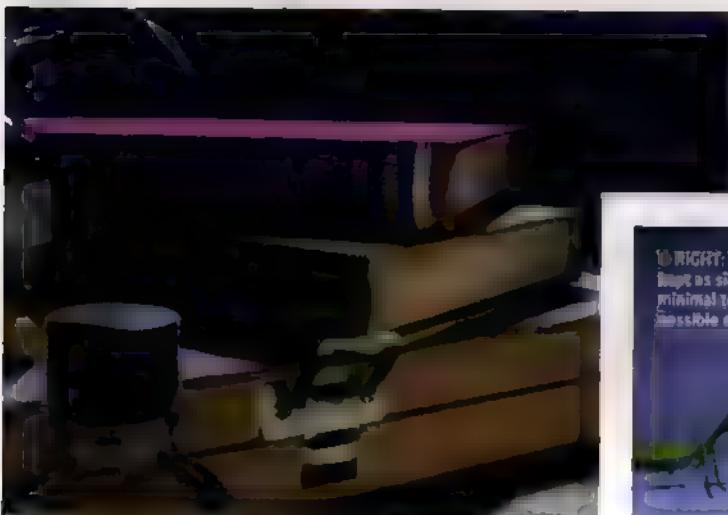
- Dell 3.0GHz P4
\$800
- HP Scanner
\$75
- 6x9 Wacom tablet
\$150

RUNNING TOTAL: \$2,295

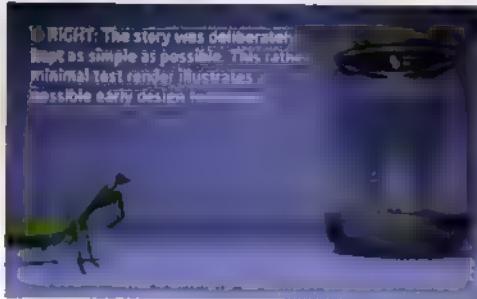




• ABOVE: *The Mantis Parable* features two characters: a caterpillar and the praying mantis of the title. Having realised his predicament, the caterpillar climbs the branch inside the jar, intending to escape from his glass prison



• LEFT: The intro sequence pans over the bug-collector's desk, setting the stage and providing a moody tone for the parable



At work, I currently use 3ds max 5. It seemed a logical choice for the film. At home, I had an 800MHz PIII Dell PC with 256MB RAM and 40GB HD which I used for a couple of months before purchasing a 3.0GHz PIV Dell with 512 MB RAM and 80GB HD. This became my primary machine for the rest of the project.

BUILDING A HOME STUDIO

Seeing this as an opportunity to create a self-supporting home studio, I also began looking for my own copies of the software I'd need in addition to 3ds max. I used Photoshop for texture creation and image manipulation, After Effects for project assembly and compositing, and Dreamweaver for website development. On the net, I was able to find all my software (brand new, shrinkwrapped, unregistered versions) for dramatically less than the RRP's, including the crown jewel ofharga \$50, an unregistered copy of 3ds max 4.2 for under \$500. Sorenson Media also stepped up to the plate and offered me a free copy of the wonderful SureSqueeze Compression Software for formatting the movie clips on my website, to which I cheerfully accepted in exchange for putting the

company's logo on the site and telling people about its software. Finally a cheap Hewlett-Packard scanner from Best Buy and a Joypix Wacom Tablet from CompUSA completed the studio. I was ready for production, almost.

I hadn't spent enough time pre-rendering with max's scan-line renderer to feel comfortable. I'd been impressed with V-Ray Advanced but wasn't ready to shell out \$800 so I decided to try out the free version. It lacked many of the features of the full version but, with a little trial and error, I was able to make it work for me. I did consider using Cirra's illumination but eventually decided that I couldn't afford the rendering time. *The Mantis Parable* would be re-traced with V-Ray Free but without G. Thanks to a lot of patience and a lot of internet surfing, I spent less than \$2,500 and was ready to begin the project in earnest.

NEXT ISSUE: Production begins in earnest. Josh rigs the characters and creates the introduction to the film. As the site attracts traffic, *The Mantis Parable* also has its first brush with fame - but already the script needs rewriting.

TIMELINE

MARCH 2003

An idea for a short film dawns: a parable about a caterpillar in need of a helping hand, and a passing praying mantis

MAY 2003

A rough storyboard for Act I is scribbled while flying home from Los Angeles after attending E3. An exclusive clip from the film and an overlay of that initial rough storyboard is available on this issue's CD



• Cell from the Initial storyboard for Act I

JUNE 2003

Purchasing of hardware and software required for initial production phase is complete

JULY 2003

The Mantis Parable website, complete with a 'production journal', 'making of' section, and an (empty) guestbook, goes live. For details, see the boxout below

NEXT ISSUE

Finding reference material, rigging tests, and rendering the intro sequence

SEE THE MANTIS PARABLE

• The Mantis Parable is currently being screened at festivals worldwide. For details, or to view the intro sequence, visit the website below. An exclusive clip from Act I (with storyboard overlay) can be found on our CD www.themantisparable.com



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INSPIRATIONS

Framestore CFC's **Ilyas Kaduji** on the rare moment of calm in Star Wars: Episode IV - A New Hope that had a huge impact on his career



"FOR ALL THE chase sequences and explosions in the original *Star Wars*, it was a moment of reflection that changed the course of my life. It's near the start of the movie, where Luke is having an argument with

Uncle Owen - he wants to go with his friends and join the Academy, and Owen tells him that he can do it next year, after harvest. But he's young, full of energy; he knows that there are big things going on out there, and that he wants to be a part of them. Eventually, he walks outside to be with his thoughts, and you first see a close-up of his face... and then the twin sunsets.

It was Luke's sense of anguish that got to me most. I was in that phase that most boys go through when they feel held back in their home lives - I must have been about nine at the time - and I imagined myself in

the movie, I've always been a bit of a dreamer, a bit of a romantic, and I thought: "Wouldn't it be great to dream like that and make it a reality?"

After that, I did anything craft or design-related I could. I went to university to study fine art, and ended up working in visual effects. That scene in the movie still influences my work - what it did was to give me the impetus to put my personal feelings into things, rather than simply make them look good. Above all, it has a child-like sense of wonder, and that's something that's all too easy to lose in the daily drudgery of life, particularly in an industry like this one."

Ilyas Kaduji is a Technical Director at Framestore CFC, where he is currently working on the new *Harry Potter* movie, which is due out 18 November 2005
[w] www.framestore-cfc.com

Iconic Imagery:
After arguing with Uncle Owen, Luke stares out at the twin sunsets of his home planet, Tatooine, reflecting on his future



SEE FOR YOURSELF...
Star Wars: Episode IV - A New Hope is available on video and DVD as part of the *Star Wars* trilogy box set, released by Twentieth Century Fox
[w] www.starwars.com

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MOJOWORLD 2 SE is a fully functional Special Edition of Pandromeda's fractal-based world building application *Mojoworld*, as sold for \$149. After installing the software, you'll need to obtain a registration key. The first time you run the software, simply click the 'Get Registration Key' button. This will take you to the website where you need to enter the following magazine code: 30W065.

See page 50 for an exclusive tutorial by Calyx Omphalos, who introduces you to the software by showing you how to create and render a science-fiction planetscape.

After you've explored *MojoWorld 2 SE*, you might want to upgrade to the latest version of the software. In *MojoWorld 3*, tools for manipulating primitives and imported models have been dramatically improved. Version 3 also adds several new object types, including pre-textured plant models, a PhotoBillboard object, a Boulder tool, and a get spotlight.

3D World readers can buy *MojoWorld 3* at a 20 per cent discount on the retail price. For full details, turn to page 54, www.pandromeda.com

FACTFILE

FORMAT
PC / Mac

MINIMUM SYSTEM

Windows 98 SE / 2000 / XP; Mac OS 9 or OS X; Pentium III / Athlon / TGHz G4 processor; 256MB RAM

DEVELOPER

Pandromeda, Inc

WEBSITE

www.pandromeda.com

USING THE CD

GETTING STARTED

On a PC, this CD should auto-run when inserted into your CD drive. If not, run 3dw.exe. To toggle autorun on and off, use the Control Panel on your computer. On a Mac, choose 3DWClassic or 3DW10SX to suit your operating system.

USING THE INTERFACE

The disc interface requires Windows 98, Me, 2000, XP or Mac OS 8+. You'll also need an active internet connection to make full use of the interface. For best results, ensure you're using a version 3 Web browser or better.

POINTS TO NOTE

- Some software may require free registration over the internet or by phone
- Some software may not be available in all territories
- Values quoted are the original prices for which the software was sold (including packaging and manuals).

Pupik 3D models

MAXFORMAT A selection of five transport models, worth over \$400

THIS GREAT selection of five models to use in your own projects comes courtesy of talented 3D artist pupik. For more pupik models, visit the Turbo Squid online marketplace www.turbosquid.com



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FULL CD CONTENTS | What's on the 3D World disc this issue



UPCOMING EVENTS

SIGGRAPH 2005

Yes, the biggy is back - although last year's mother of all 3D shows may still feel like yesterday, it's that time again. This PDF of the advance programme gives you a sneaky peek at all the scheduled events and confirmed speakers for the five-day international conference. With George Lucas giving the keynote speech, this year's SIGGRAPH is definitely not one to miss... www.siggraph.org/s2005

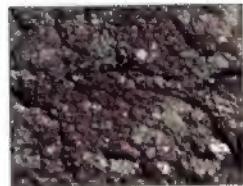
LEAD CONTENTS

MOJOWORLD 2 SE

KURV STUDIOS ZBRUSH TRAINING

PUPIK MODELS

For full details, see facing page



OTHER RESOURCES

100 TEXTURES

High-resolution JPEG images from morgueFile suitable for use in commercial projects. The set includes images of natural textures, paint, wood and flooring. Note: the textures are not pre-tiled www.morguefile.com



CD MISSING?

For a replacement, please contact your newsagent



FREE BONUS FILES!

Additional tutorials and supporting materials are now available for download from the recently redesigned 3D World website www.3dworldmag.com

SUPPORTING FILES

Full-sized screenshots, project files and other resources to accompany the tutorials and Q&As printed in the magazine this issue
Magazine contents: page 4



TROUBLESHOOTING

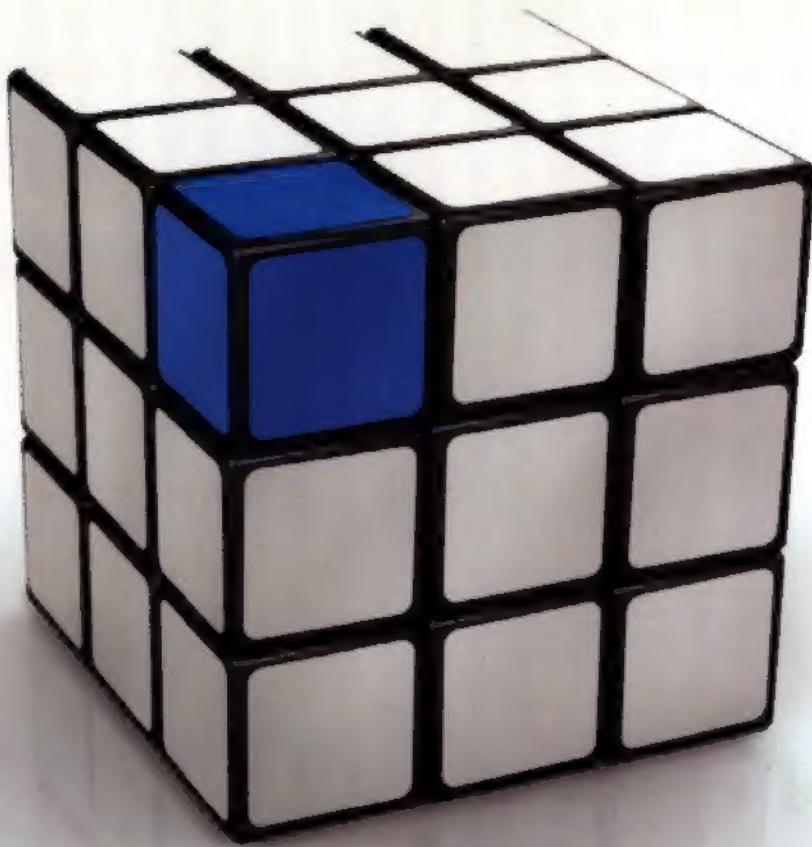
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